Computer and Information Science; Vol. 9, No. 3; 2016
ISSN 1913-8989 E-ISSN 1913-8997
Published by Canadian Center of Science and Education

Observation of a Most Phenomenal Computed Calligraphy in Quran

Baback Khodadoost[1]

[1] Independent Researcher, Ph.D. in atomic and molecular physics, Iran

Correspondence: Baback Khodadoost, AEOI P. O. Box: 14395-836, Tehran, Iran. E-mails: bkhodadoost@aeoi.org.ir/babackhodadoost@gmail.com

Received: June 23, 2016 Accepted: July 2, 2016 Online Published: July 28, 2016

doi:10.5539/cis.v9n3p42 URL: http://dx.doi.org/10.5539/cis.v9n3p42

Abstract

Observation of a multifaceted mathematical-computational structure of Quran through analysis of its letter and word frequencies and important implications of such observations have been extensively explained and discussed in a recent article: “Khodadoost B. (2015) The Computed Scripture: Exponentially Based Fourier Regulated Construct of Quran and its fundamentally important Consequences". In the present article we report observation of yet another facet of this mathematical structure of Quran which is a phenomenal "parametric name-printing”. This observation has been made through a systematic compute-plot algorithm which uses the given name and chapter frequencies of letters in Quran as its input and shows in the output, calligraphic printing in Arabic of the same name. Several names of God, Major Prophets, and even some physicists are shown to clearly manifest these calligraphic effects. Sensitivities of these observations to changes in letter frequencies in Quran are so high that increase or decrease of even one letter and only in one chapter of Quran can completely demolish the calligraphic effects. These astonishing observations not only are extremely important and interesting in their own right, but also point to an immensely complicated and intricate super-intelligent mathematical design of Quran and reinforce "Mathematically Fully constrained Writing" or MFCW identity of this scripture and its consequences as explained in the above mentioned article.

Keywords: cf-plot, df-plot, mfcw, nbfs, qgcc, quran, quran generated computed calligraphy, sf-analysis

1. Introduction

In this article we use a previously introduced MLF method (Khodadoost, 2015) and will make the Natural Variations NVs and thereby SVs of certain names in Quran and will perform the SF-analysis to compute the related F-parameters. The NBFS couplings and effects for these names will be shown but unlike the previous article we shall not focus on these effects. Instead, we will reveal a startling series of calligraphies of names in Quran which are observed through plot of the F-parameters (F-plots). These astounding graphical productions of Quran will be referred to as “Quran Generated Computed Calligraphies” or QGCCs.

In this article we will first present SF-analyses and F-plots of some Arabic and non-Arabic names including some names of God and prophets mentioned in Quran and also of some famous theoretical physicists. The reason or motivation for such selection of scientists will be explained later. It must be kept in mind that whenever in this article we speak of the NV and thereby SV of a name it means the MLF made Variation of that name (Khodadoost, 2015; this fundamental article will also be referred to as the CS-article).

1.1 Review of the MLF Made Variations in a Book

In the CS-article it has been explained in detail how MLF variation of *any name* can be constructed for *any book* written in *any language*. As a reminder, here we explain briefly how this is done. Suppose we want to know how many words "man" can there be in each chapter of a certain book written in English. A simple way to do this will be to count the number of letters “m”, "a", and “n” in each chapter and then see which of these 3 letters has the minimum occurrence frequency in that chapter. Obviously, this minimum number will determine how many words “man” we can have in that particular chapter. We called this MLF (Minimum Letter Frequency) method of making name variations. Using this method, Natural Variation of any name, phrase, or even sentence can be made in any given book. It is this MLF made variation of names in Quran that is put to SF-analysis and its computed F-parameters show in addition to NBFS effects (CS-article), such amazing calligraphic effects.

Obviously, letters of alphabet with lesser occurrence rates will have the major contribution in the MLF method of making name variations. On the other hand letters with the highest occurrence rates will have the least or no contribution in MLF method of making name variations. Therefore, usually for each name only certain letters of that name which we call "contributing letters" play role in making its MLF variation. This also means that in a certain book (notice here the important book-dependence), there can be several different names all having same MLF made variation due to having same contributing letters, as we will see in this article. Names with common contributing letters in their MLF made variation in a book can be called, Identical MLF, or Identical NV names for that particular book. For instance, Arabic names الرحمن and رحمن have identical MLF made Variations in Quran, because letters alif and lam "ا ل" which have the highest occurrence frequencies in Quran have no contribution, not only in MLF made variation of الرحمنbut in MLF made variations of many other names as well. Also, for instance, God's names Fatir فاطر, and Latif لطيف, and the name Fatima فاطمه, all have same contributing letters (**ف** and **ط**), and therefore have identical NV and thereby identical SVs in Quran (for a complete list of Arabic letters and their English pronunciations see Arabic alphabet, or the CS-article).

In this article we will present a phenomenal Parametric writing of names in Quran which is only observable through the F-plots of the Sorted Variation of these names. These observations not only add new proportions to an already multifaceted, extremely complex MFCW construct of Quran, but also show the astonishing high level of mathematical-computational intricacies in quantitative design of Quran. These manifestations can be regarded as super-intelligent mathematical messages masterfully encoded into the textual structure of Quran mainly as reminders of the timeless and boundless knowledge and power of The Author of Quran to the scientifically and technologically advanced humans of the future times.

2. The NBFS Marking of Names in Quran

As was shown and explained in sections 12 and 15 of the CS-article, it appears that certain names relevant to the mathematical scenario of Quran have been marked through NBFS couplings and effects. These markings were observed through the F-plots of the MLF made Sorted Variations of names in Quran (Khodadoost, 2015). In this section we will introduce additional SF-analyses of certain other Arabic names including some names of God and prophets mentioned in Quran. We shall also present the F-plots of some non-Arabic names in Quran of certain theoretical physicists. All results are obtained using exactly the same methods and the same statistics of Quran (Madi, M. 2010; Quran Suras statistics) which were introduced and used in the CS-article.

Because of the importance of these observations, and in order that presented results can readily be verified by the interested readers, in Appendix A we present the exact statistics of letters in Quran that have been used in this and its preceding CS-article. This Appendix shows the reduced (lumped) form of 36 to 28 main Arabic alphabets (Madi, M. 2010; a study of Arabic letter frequency analysis). Statistics of the opening statement have also been included in Tables of Appendix A, just as was done in the CS-article.

2.1 NBFS Marking of Names of God and Prophets in Quran

There are many names of God mentioned in Quran and obviously SF-analysis of all these names was not possible in the first round of such analyses. It was therefore decided to select a few prominent names of God and these were; the three names specified in the opening statement, the five names mentioned in the most celebrated verse of Quran "The Throne Verse", and the four names of those chapters which are also the names of God; that is a total of 11 different names of God in Quran. The names of five Major Prophets mentioned in Quran who have had worldly missions, the name Mary, and two other popular Arabic names which will be shown to manifest clear calligraphic effects have also been used for these analyses. The MLF made NVs of these Arabic names which are shown in Table B1 of Appendix B, are first made based on the statistics given in Appendix A. Next, the SF-analysis of the SVs of these NVs is performed for each name. The NBFS couplings and effects observed for these Arabic names are shown in Table 1 and selected F-plots of these names are also shown in Figures 1-19. In Table 1 abbreviations and notes are exactly the same as were explained for Tables 5 and 6 in the CS-article, with the addition of notation "T" which stands for "Terminal J-value".

The three names of God mentioned in the opening statement in Quran are: Allah الله, Alrahman الرحمن, Alrahim الرحيم. The four other names mentioned in The Throne Verse (Quran, 2, pp. 255) are: Hayy حی, Qayyum قيوم, Ali على, and Azim عظيم. The names of four chapters which have names of God are: Nour نور, Fatir فاطر, Ghafir غافر, and Al-A'la الاعلى.The names Muhammad محمد, Ahmad احمد, Jesus عيسى, Messiah or Christ مسيح, Mary مريم, Moses موسى, Abraham ابرهيم, and Noah نوح which are mentioned in Quran, and names Hasan حسن and Mahdi مهدى for their unique calligraphic effects, have been included in the Arabic names under the analysis in this article.

It should be mentioned that in "Azim" عظيمthe only contributing letter in making its MLF made NV is letter dha (ظ) so its SF-analysis results are identical with that of letter dha and therefore it was eliminated from Table 1 (see instead, letter dha effects in Table 5 of the CS-article and also in its related F-plots). Also, NVs of Ali على

and Al-A'la الاعلى are the same (have the same contributing letters), so we only present results for Ali.

Following Table 1, the F-plots of these names will immediately be presented while explanations are much like those expressed in the CS-article. After becoming familiar with definitions and abbreviations which are introduced and explained in the CS-article, the reader can use Table 1, and can easily detect corresponding NBFS couplings and effects associated with each name.

Table 1.

Name	K(e)SV	beta(e)SV	A-SV	alpha(e)SV	alpha(10)SV	Observations
الله **Allah**	(19, 0.323)	(95, 0.57)	(19, 1.33)	CV(0-4, 19) CV(102-112, 19)	(0, 47.5) (19, 38) (38, 34.2) (76, 38) (95, 38)	
الرحمن **Alrahman**	Am(0, 0.076) ext (19, 0.38) CV(8-32, 0.38) CV(46-74, 0.19) CV(82-90, 0.19)	Am(0.038) ext (38, 0.0456)		AM(0, 26.6) (57, 20.9) ext (95, 20.9) Am(106, 19)	AM(0, 60.8)	
الرحيم **Alrahim**	AM(0, 0.76) ext CV(10-32, 0.38) CV(64-84, 0.19) TM(112, 0.38)	Am(0, 038) ext (2, 0.0399) (38, 0.0456) (76, 0.0475) AM(106, 0.0513)	(38, 1.33) (95, 1.14) T(112, 1.444)	AM(0, 26.6) (57, 20.9) (76, 20.9) Am(106, 19)	AM(0, 60.8) (95, 47.5) ext	
حى **Hayy**	CV(14-22, 0.38)	CV(0-2, 0.038) (19, 0.38) (38, 0.0456) AM(72, 0.494) ext	(2, 1.9) (76, 1.14) (95, 1.33) ext (112, 1.33)	(0, 26.6) (76, 19)	(2, 57) (19, 51.3) ext	
قيوم **Qayyum**	(38, -0.76) ext (76, -133) AM(102, 57E+3)	(2, 0.057) (95, -209) ext	(19, 0.76) (76, 38E-59) AM(84, 2.8E+152)	(0, 19) CV(14-19,19) (57, 9.5)	(0, 47.5) (2, 39.9) CV(2-12, 38) (19, 38) (38, 34.2) (95, -0.019)	FC(19) (Fundamental Coupling)
على **Ali**	(0, 0.76) (57, -1.9)	(19, 0.0608) (76, 0.057) (95, 0.133)	(2, 1.52) (19, 0.95) ext (38, 0.76) (57, 0.152) (76, 1.14) (95, 0.0133) ext T(106, 532E-46)	(2,19) (76, 17.1) AM(84, 95)ext Am(86, -32.3) (95, 7.6)	(19, 38) ext (57, 24.7) (76, 38) Am(86, -76)	
نور **Nour**	AM(50, 0.57)	Am(0, 0.0437) AM(50, 0.057) ext CV(34-80, 0.057) (95, 0.057)	AM(0, 3.8) (19, 2.28) CV(32-86, 1.9) (57, 1.9) ext	AM(0, 22.8) ext CV(2-112, 19) FC(19, 19) ext	(19, 43.7) (76, 41.8)	FC(19)

			(95, 1.9)			
فاطر **Fatir**	(19, -3.8)	(38, 1.33)	(19, 2.47) ext AM(34, 171E+13)	M(38, 0.76) ext	(0, 57) (57, -0.019) T(78, 95E-7)	
Ghafir غافر	(19, 3.8) ext (57, 19E+4)	(0, 0.0418) (57, -302E+1) AM(60, 38E+2)	(19, 45.6) ext AM(36, 399E+198)	AM(24, 60.8) (38, 0.19) T(68, -95E-7)	(0, 55.1) (2, 47.5) (57, -76E-5) ext	
محمد **Muhammad**	(19, -0.323) (76, -5.7) (95, -89.3) T(108, -114E+1)	(57, 0.0722) ext T(108, 19) ext		(19, 19) CV(4-32, 19)		
احمد **Ahmad**	(0, 0.361) (19, -0.266) AmT(108, -19E+2)	(95, 0.76) ext Am(104, -19) ext	(19, 0.76) (95, 513E-21)	(19,19) ext CV(4-32, 19) (57, 19) ext (95, 1.33)	(38, 34.2) (95, 3.02)	
عيسى **Jesus**	(0, 0.38) (19, -0.057) (38, -0.399) ext (95, 4.56)	(76, 0.076) ext		(2, 19) ext (19, 19) ext CV(2-26, 19) (76, 13.3) Am(95, -39.9) m(102, -15.2) M(104, 17.1)	(0, 49.4) ext (38, 38) (76, 30.2) ext Am(95, -91.6) M(104, 38)	FC(19)
مسيح **Messiah** **(Christ)**	T(112, 0.057)	(38, 0.0513) ext (57, 0.0532) AM(70, 0.057) (76, 0.057) (95, 0.0513) ext	(76, 0.703) ext (95, 0.95)	(19, 19) CV(6-112, 19) Five consecutive 19 couplings	AM((0, 57) (2, 51.3) (95, 45.6) ext M(100, 47.5)	FC(19)
مريم **Maryam**	(0, 1.14) (19, 0.475) T(112, -0.19)	(0, 0.0456) (19, 0.057) ext (76, 0.0665) (95, 0.0703) T(112, 0.0684) ext	(2, 2.28) (57, 0.95) (95, 0.76)	(2, 19) (19, 19) (57, 15.2)	(38, 38)	
موسى **Moses**	(57,0.0114) (76, -0.19)	(2, 0.0494) (19, 0.057) (38, 0.0532) AM(76, 0.057) (95, 0.057) T(112, 0.532)	AM(0, 1.9) (95, 0.95) M(108, 1.33)	CV(2-112, 19) Five consecutive 19 couplings	AM(0, 53.2) (19, 41.8) Am(76, 38)	FC(19)
ابراهيم **Abraham**	AM(0, 0.817)		AM(0, 2.28) (19, 1.14) (57, 1.14) T(112, 0.722)	(0, 20.9) (2, 19)	(19, 38) ext CV(8-80, 38)	
نوح	AM(0, 0.76)	Am(0, 0.038) ext	(2, 1.9)	(57, 20.9)	AM(0, 60.8)	

Noah	(19, 0.38) (57, 0.171) ext (76, 0.19) Am(110, -0.19)		(38, 1.33) ext (95, 1.14) Am(110, 0.836)	(76, 20.9) Am(110, 19) T(112, 19)	(2, 57) (19, 51.3) (95, 47.5)	
حسن **Hasan**	AM(0, 0.456) ext (19, -0.133) (57, -0.19) Am(74, -0.38) CV(68-76, -0.38) M(100, 0.019) ext	(38, 0.0513) AM(74, 0.057) CV(66-80, 0.057) T(112, 0.0532)	(19, 0.874) (95, 0.95)	CV(6-112, 19) With 5 consecutive couplings at MN(19) including 3 exact ones at J=19, 38, and 57	(0, 57) (57, 43.7) ext (95, 45.6)	FC(19)
مهدی **Mahdi**	(19, -0.19) (57, 0.38) T&Am(108, -494E+1)	(0, 0.0456) (19, 0.057) (38, 0.076) (57, 0.057) (95, -1.9) Am(104, -13.3)	(0, 1.52) (19, 0.988) (76, 0.38)	((2,19) (19, 19) (38, 13.3) AM(78, 57) ext Am(82, -76E+1)	(19, 43.7) (38, 30.4) AM(78, 133) Am(82, -171E+1) (95, -1.14)	FC(19)

NBFS Couplings and effects observed for the F-parameters computed for the MLF made Sorted Variations of the mentioned Arabic names in Quran

2.1.1 F-plots of the Selected Names of God in Quran

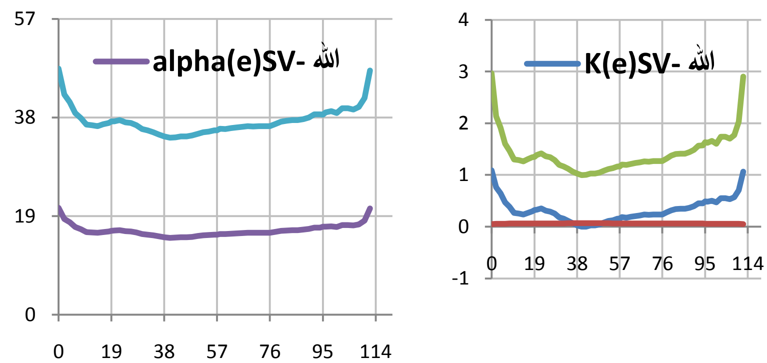


Figure 1. F-plots of the Sorted Variation of the Arabic name "Allah" (الله)in Quran

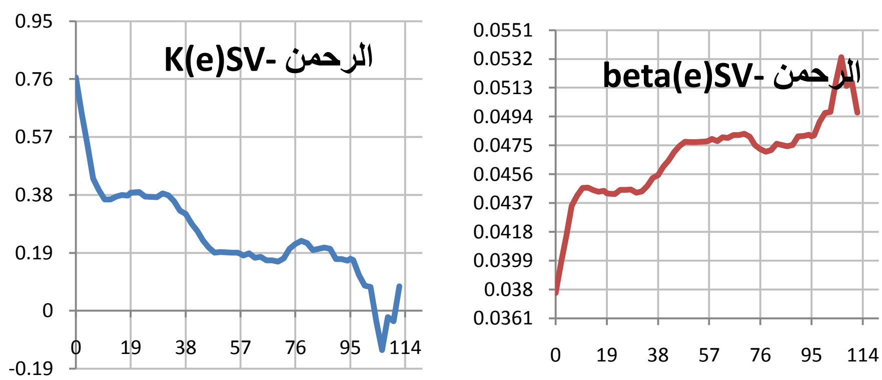


Figure 2. Selected F-plots of the Sorted Variation of the Arabic name "Alrahman" (الرحمن) in Quran

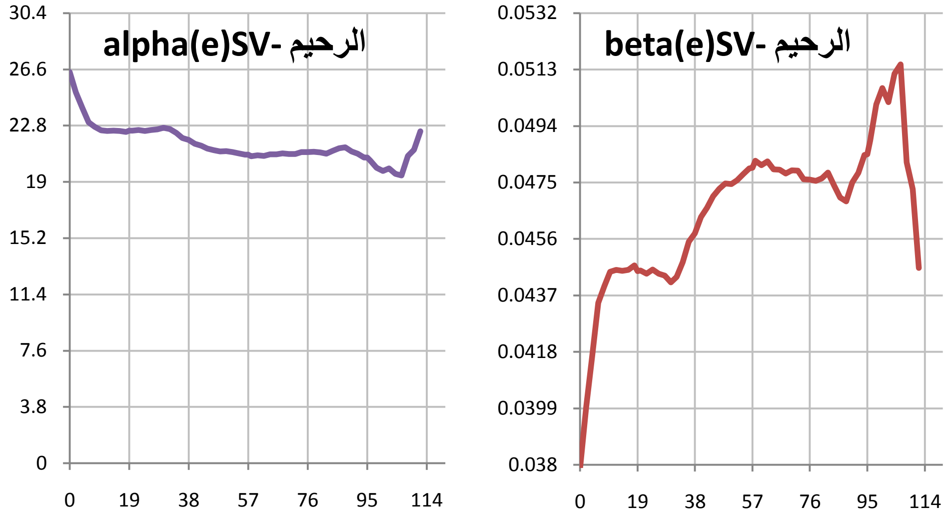


Figure 3. Selected F-plots of the Sorted Variation of the Arabic name "Alrahim" (الرحيم) in Quran

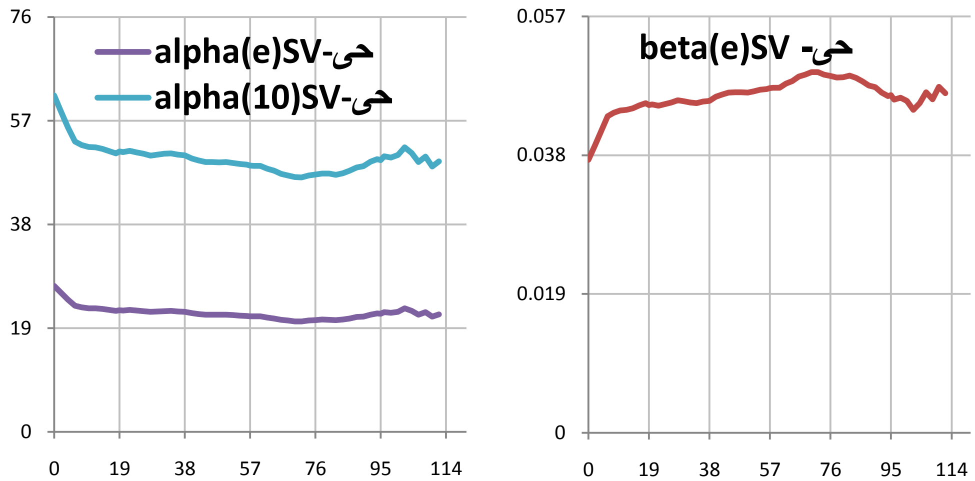


Figure 4. Selected F-plots of the Sorted Variation of the Arabic name "Hayy" (حى) in Quran

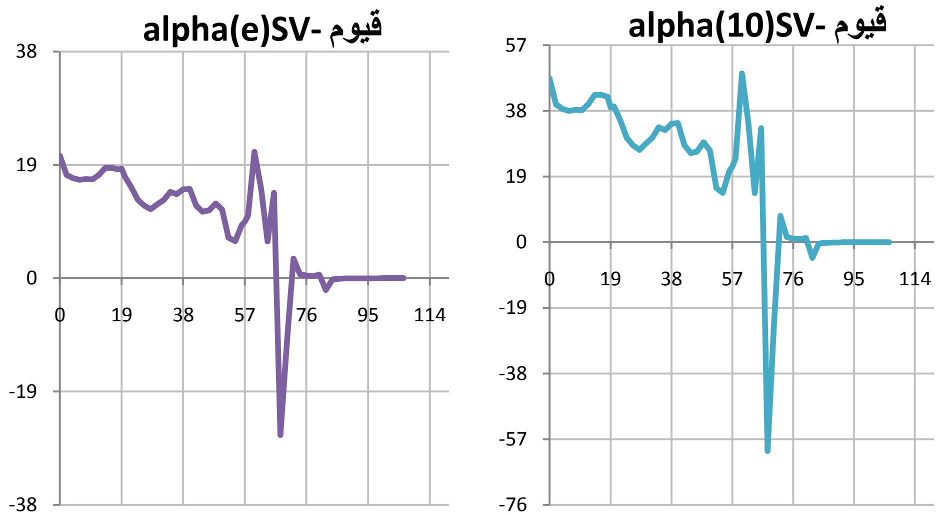


Figure 5. Selected F-plots of the Sorted Variation of the Arabic name "Qayyum" (قيوم) in Quran

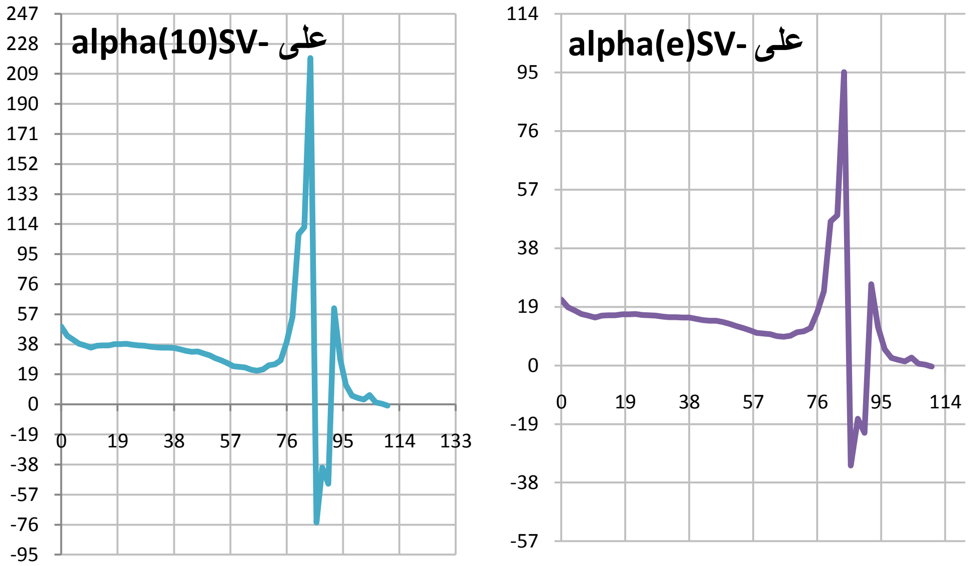


Figure 6. Selected F-plots of the Sorted Variation of the Arabic name "Ali" (على) in Quran

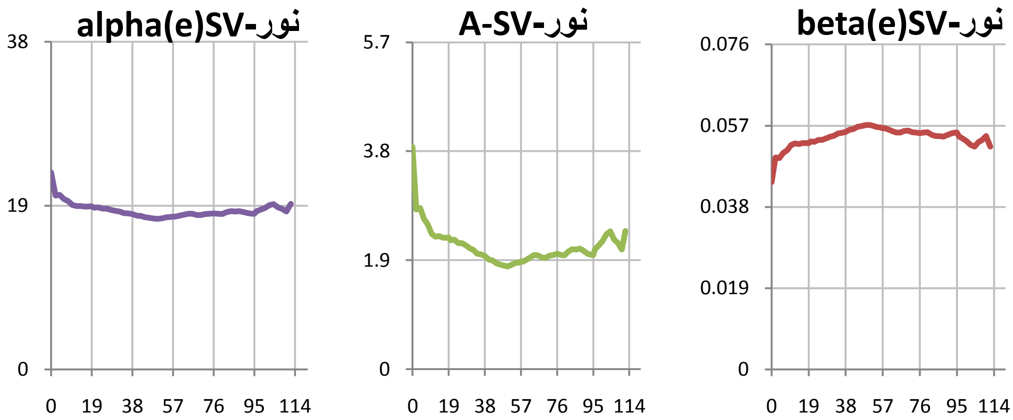


Figure 7. Selected F-plots of the Sorted Variation of the Arabic name "Nour" (نور) in Quran

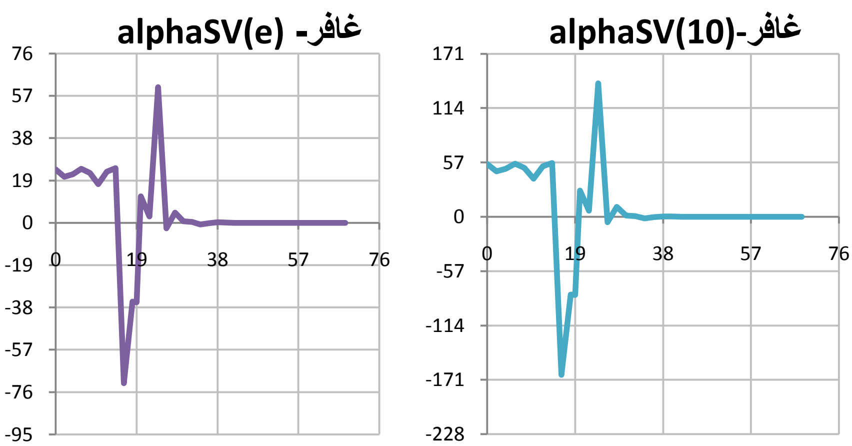


Figure 8. Selected F-plots of the Sorted Variation of the Arabic name "Ghafir" (غافر) in Quran

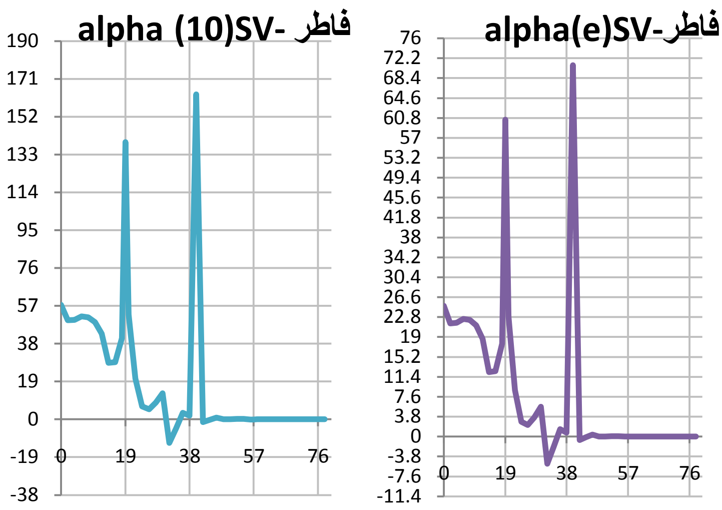


Figure 9. Selected F-plots of the Sorted Variation of the Arabic name "Fatir" (فاطر) in Quran

2.1.2 F-plots of the Names of Major Prophets

The F-plots of 8 names Muhammad, Ahmad, Jesus, Christ, Moses, Abraham, and Noah and Mary will be presented in the following graphs.

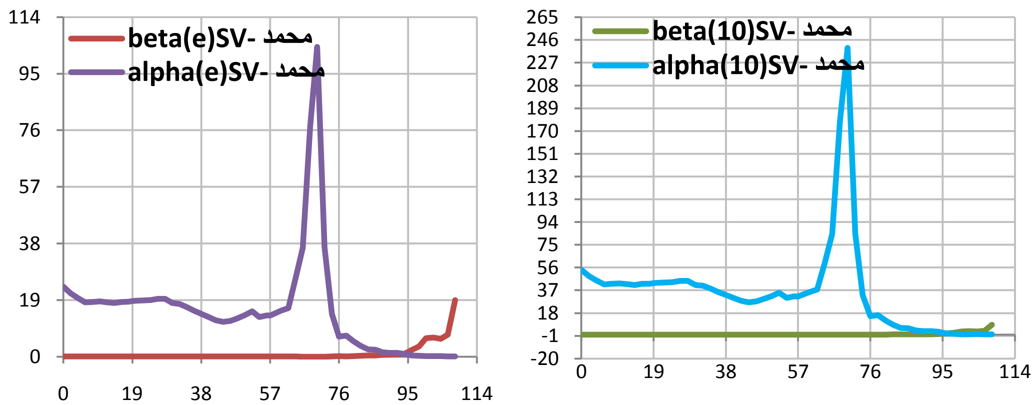


Figure 10. Selected F-plots of the Sorted Variation of the Arabic name "Muhammad" (محمد) in Quran

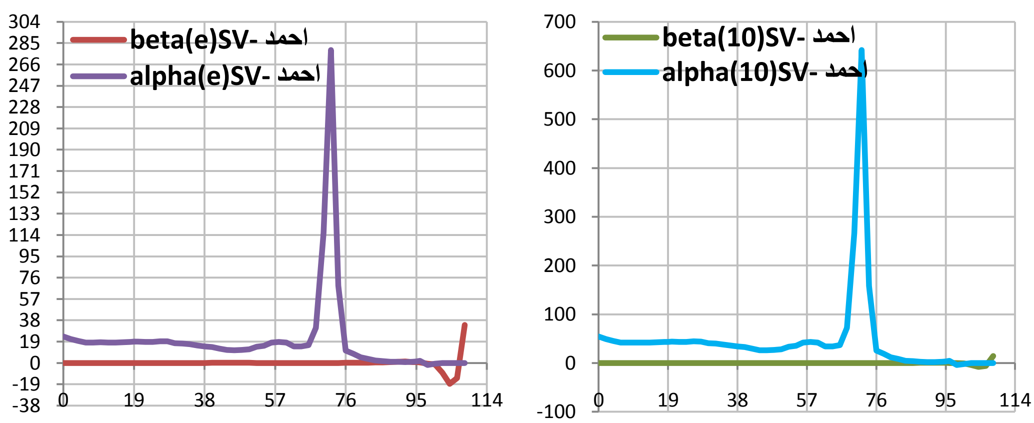


Figure 11. Selected F-plots of the Sorted Variation of the Arabic name "Ahmad" (احمد) in Quran

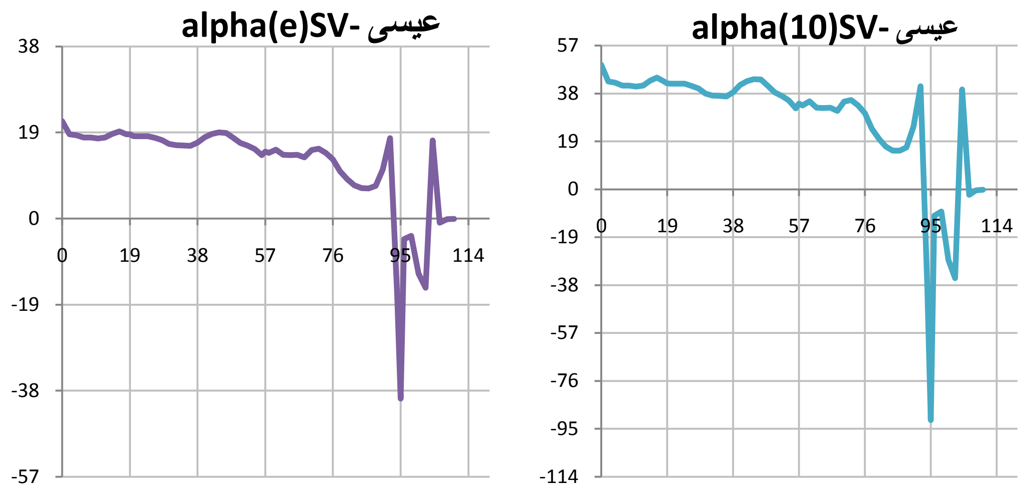


Figure 12. Selected F-plots of the Sorted Variation of the Arabic name of "Jesus" (عيسى) in Quran

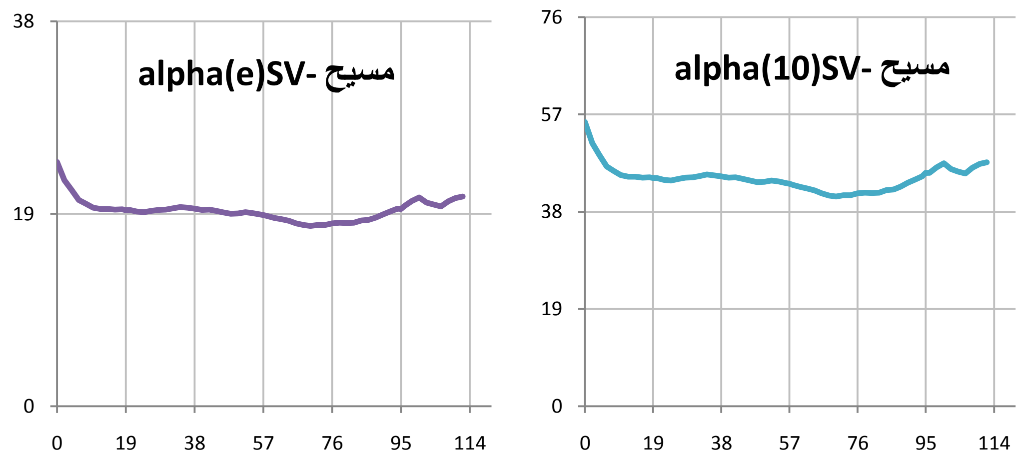


Figure 13. Selected F-plots of the Sorted Variation of the Arabic name of "Messiah or Christ" (مسيح) in Quran

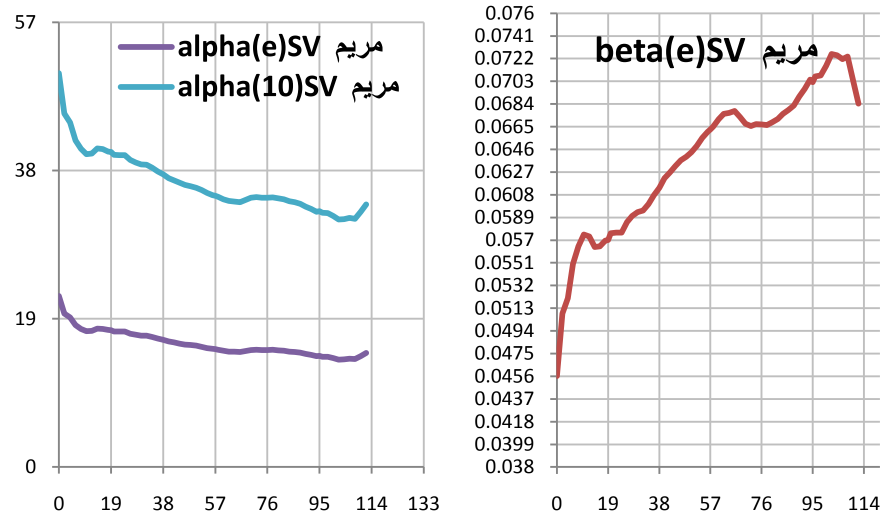


Figure 14. Selected F-plots of the Sorted Variation of the Arabic name of "Mary" (مريم) in Quran

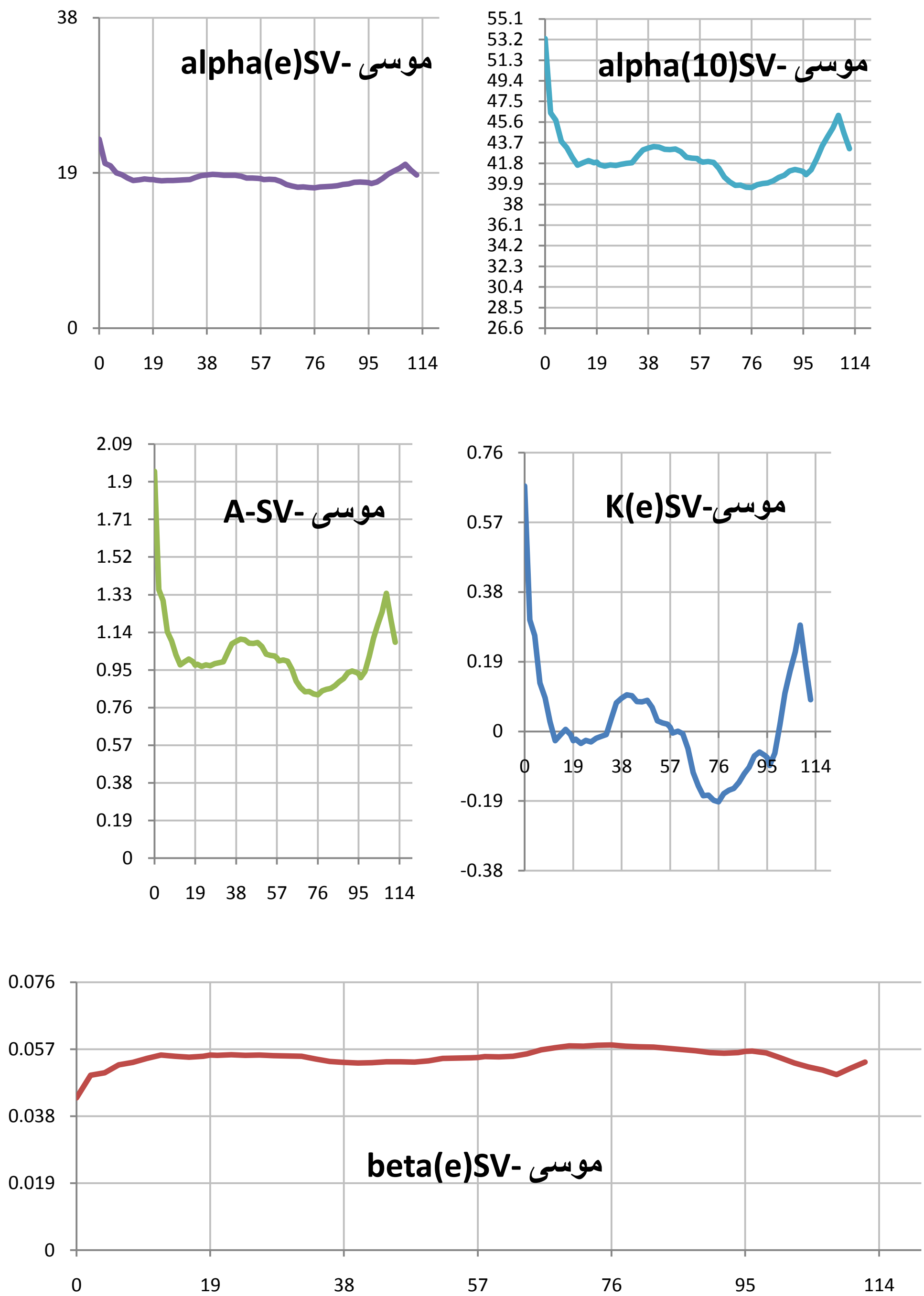


Figure 15. Selected F-plots of the Sorted Variation of the Arabic name of "Moses" (موسى) in Quran

Notice here, in the case of Moses similarity in shapes of the F-plots for all F-parameters except for beta. Also pay attention to the different appearances of the same type F-parameters, alpha(e) and alpha(10) in their F-plots, a difference caused by different observation aspect ratios. The importance of aspect ratios will become more evident when we begin to observe calligraphic effects through the F-plots.

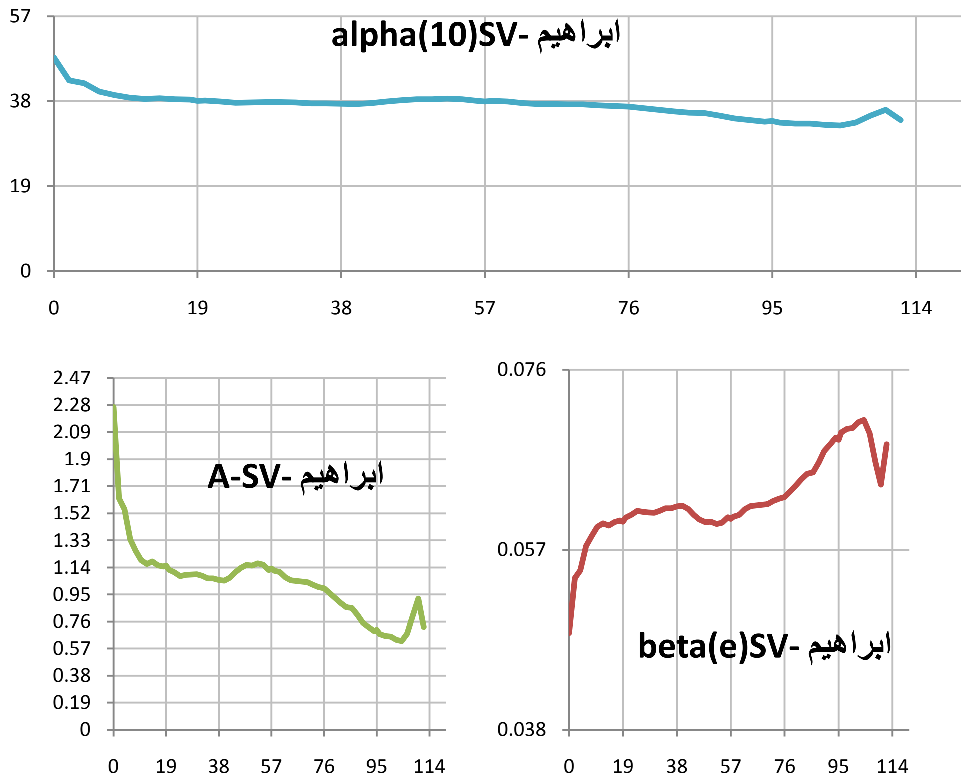


Figure 16. Selected F-plots of the Sorted Variation of the Arabic name of "Abraham" (ابراهيم) in Quran

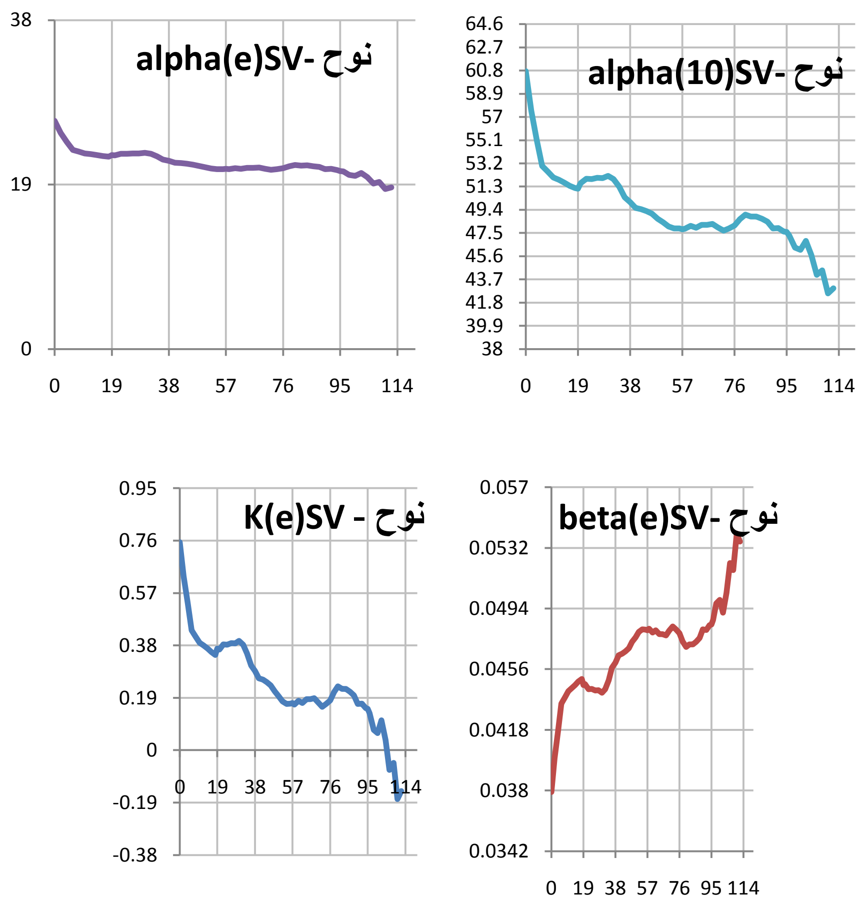


Figure 17. Selected F-plots of the Sorted Variation of the name" "نوح (Noah) in Quran

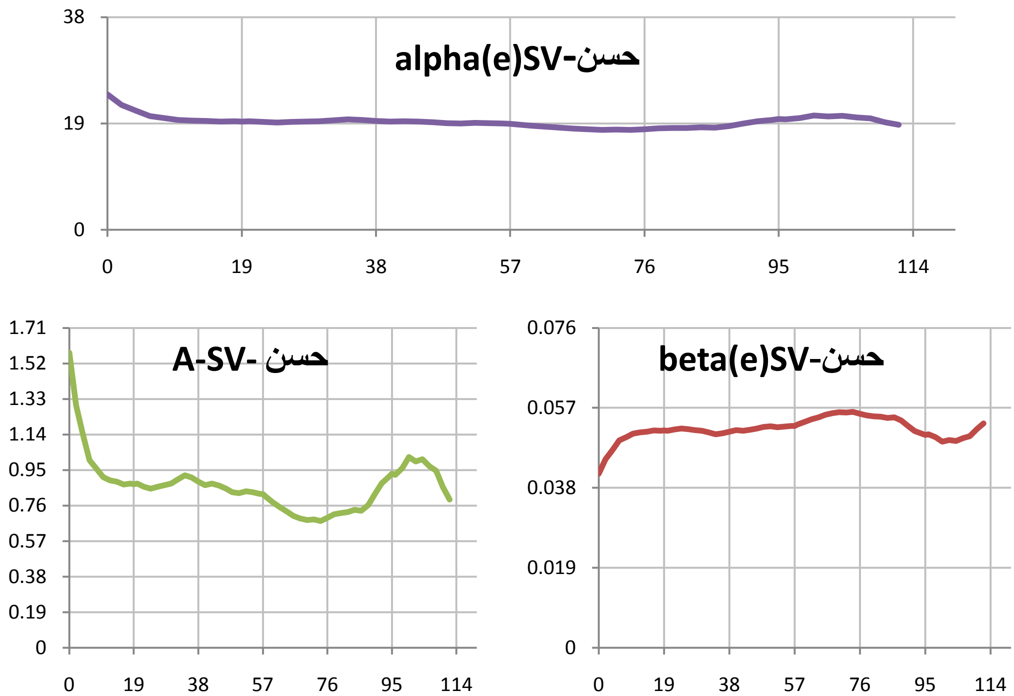


Figure 18. Selected F-plots of the Sorted Variation of the Arabic name "Hasan" (حسن) in Quran

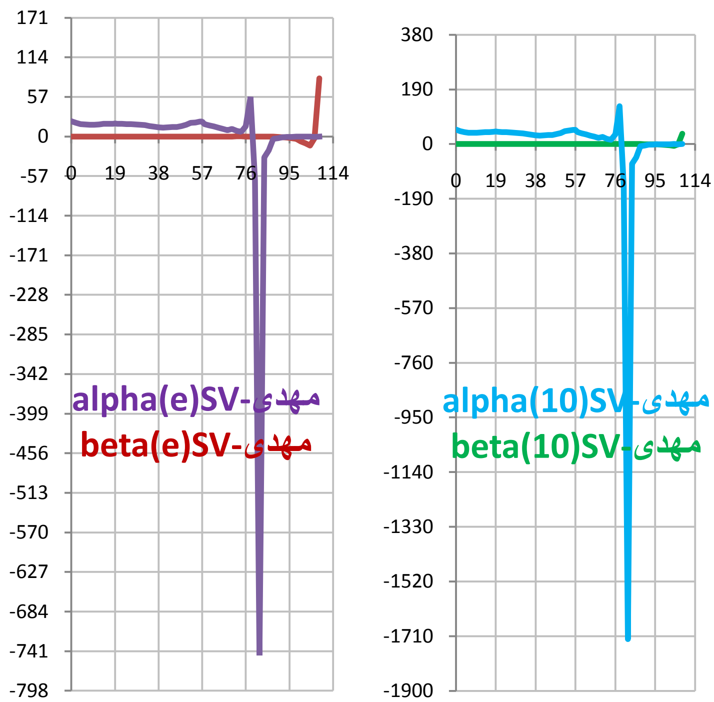


Figure 19. Selected F-plots of the Sorted Variation of the Arabic name "Mahdi" (مهدی) in Quran

3. Observation of the Computed Calligraphy of Names in Quran

Calligraphy is defined as "... a visual art related to writing. It is the design and execution of lettering with a broad tip instrument, dip pen, or brush, among other writing instruments" (Calligraphy 2016). Works of calligraphy are observed in almost all languages and Islamic Calligraphy in particular, is a well developed art dating back to many hundreds of years ago. There are several styles such as Naskh, Tholth, Nastalique, etc., which have been used by Islamic calligraphers throughout the recent centuries (Khatibi A. & Sijelmassi M.,1996) and we will show some examples of these art works further ahead in this article.

In this article and for the first time we report observation in Quran of the *Computed Calligraphy of names* as a truly phenomenal effect which is so far only observed in Quran and has never been reported anywhere before. The Computed Calligraphy can also be defined as: *Writing or fine printing through plotting of a mathematical function or parameter*.

The first observation of a Computed Calligraphy or better said “computed writing” in Quran was made when this author was examining the F-plots of the Sorted Variation of the MLF-made name “Moses” in search of its NBFS couplings and effects. Amazingly, a peculiar resemblance was noticed between the F-plots of the name Moses and the way word “Moses” is actually written in Arabic (Figure 15). Following this very interesting observation, a careful examination of the F-plots of many other names including those of God, Major Prophets, and others revealed a striking series of similar patterns masterfully engineered into their F-plots.

These effects were particularly seen to be enhanced or best observed for certain optimized graph *aspect ratios* and *line thicknesses* used in the F-plots. The astonishing implementation of these computed calligraphies in the quantitative structure of Quran will be better understood as we go through observed effects in this article.

Computed Calligraphies of “ Muhammad محمد ” and “ Ahmad احمد ” exhibit the most magnificent of all Computed Calligraphies in Quran. We therefore begin our preliminary observation of the calligraphic effects first with Computed Calligraphies in Quran of the name Muhammad.

3.1 Preliminary Observation of the Computed Calligraphy in Quran

At first sight, the top two F-plots in Figure 20 which are exact repeats of Figure 10 (with the addition of marker points), show no obvious signs of any name printings. In Figure 20 from the second row down, while keeping everything the same as before, the line thicknesses are gradually increased from top to the bottom. Also, for better observation of the calligraphic effects from the second row down all line colors have been changed to black. In the bottom row plots in Figure 20, only the two F-plots (computed in two bases e and 10) with their increased line thicknesses are shown while all other plot indicators have been omitted.

Observe now in the top to the bottom evolution of the F-plots in Figure 20, the astonishing emergence, letter by letter of the name Muhammad spelled in the Arabic language. The spelling of Arabic letters in these F-plots can be compared with the Arabic spelling of " Muhammad محمد " which is connected with dash line to alpha and beta in those same plots. Of course, in these calligraphic writings letter "ha" in "Muhammad" does not show the discontinuity which should be observed in the upper part of this Arabic letter in its Medial form (Table 4), but this is because alpha is continuous. We will show in the upcoming sections how a discrete form F-plot can be used to make these letters appear perfectly clear.

If we keep on increasing the line thicknesses to more than their final values at the bottom of Figure 20, α and β begin to merge into one another and the calligraphic effects begin to gradually disappear. It can be seen therefore, that for the best observation of these effects there is an "almost optimum" value for the thickness of the plot lines relative to the graph dimensions. This also shows that the best manifestation of the calligraphic effect depends to a large extent on the graph aspect ratio.

In the bottom of Figure 20, we show by red color, the rectangles that define the graph aspect ratios:

The Aspect Ratio (AR) is the *ratio of the width to the height of the minimum size rectangle that fully encompasses the selected curve(s) in the respected F-plot*.

The Line width Ratio (LWR) *is defined as the ratio of the thickness of the plot line to the height of the above mentioned rectangle.*

From Figure 21 onwards, we will show in calligraphic plots, without explicitly showing the fully encompassing rectangles, only the aspect ratio AR, and the line width ratio LWR of that particular exhibition.

Notice that by the "selected curve(s)" in the above definition we mean selected part (or parts) of the plotted F-parameter(s) in the F-plot that is actually used by Quran in calligraphic exhibition of the full name.

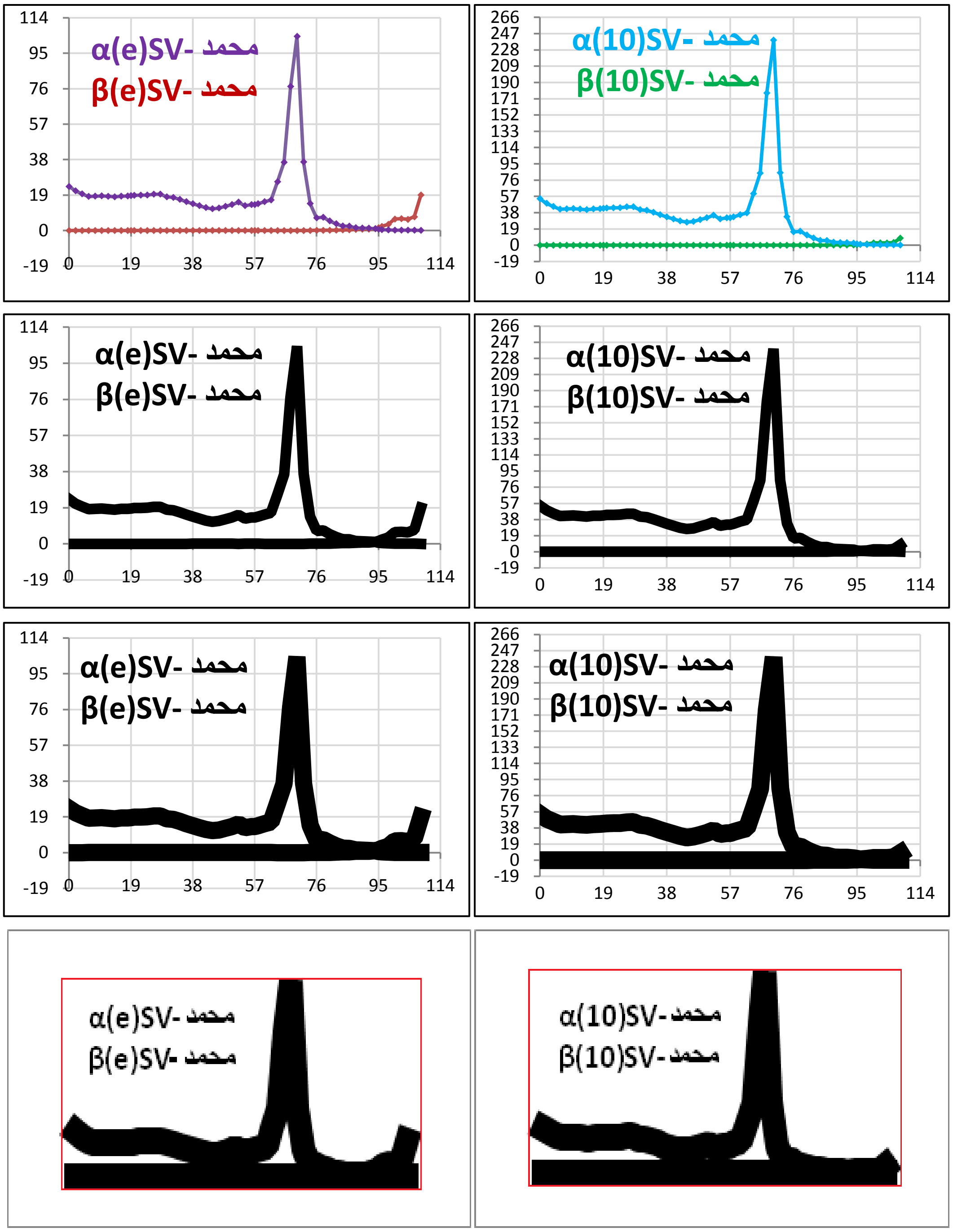


Figure 20. Appearance of the name " Muhammad محمد " generated from alpha&beta F-plots computed in both bases e and 10, as line thicknesses are gradually increased from top to the bottom (see also Figures 21-23)

Now that we have had our first encounter with the amazing calligraphic effects in Quran and before starting our tour of a most spectacular Gallery of computed arts, in order to make our observations systematic, we shall proceed by defining some relevant terms and concepts.

4. Quran Generated Computed Calligraphies: Terms and Definitions

In this article we shall speak of the ***Input Name*** which is the name used to make through the MLF method, Natural and thereby Sorted Variations (NV and SV) of that name in Quran (khodadoost 2015). The ***Output Name*** on the other hand, is the name which is observable in the final calligraphy through the F-plot of the F-parameter(s) computed from the SV of the given Input Name.

SPW (Single-Parameter writing)

Writing through plotting by a single-valued Parameter is like writing with the condition that the pen constantly be moving only in one direction on the paper, for instance always from left to right with no backward or vertical motions permissible. Obviously, writing in this fashion would be problematic for those letters that need more than one y-value for each x-value in their x-y representation. For example, letters D and E in English or ح and ع in Arabic cannot be clearly written through SPW. We will refer to such problems caused by single-valued parametric writing as, *SPW limitations*. In such cases, codes or abbreviated variants of letters can be defined as replacements for actual letters. However, in Arabic as compared to English, there are fewer SPW limitations because of the shape of characters and also existence of many variants and alternatives for alphabetic letters, particularly in their calligraphic forms as we shall see.

DPW (Double-Parameter writing)

In this type of writing two single-valued parameters (dependent or independent) will simultaneously be used in the writing. This way, it should be possible to write almost all letters of alphabet with no need to define modified versions or codes for alphabetic characters. For instance, calligraphic effects observed through simultaneous alpha and beta F-plots of the name Muhammad in section 5-1, are examples of a DPW. This particular case is also a case of dependent parameters DPW, because alpha and beta are not independent but are reciprocals of one another.

Notice that SPW effects are base-independent, for instance, alpha computed in base 10, e or in any other base will have the same calligraphic effect, and this is because the base dependence can be offset by changing the aspect ratio of the graph. However, DPW effects are base-dependent, as can be observed for the Computed Calligraphies of Muhammad, Ahmad, and some other names. This dependence will be shown and discussed in some details in section 5.1.1of this article.

CF-plot (Continuous Form F-plot or the original F-plot): As it was mentioned earlier, the F-plots which show these calligraphies and are in fact plots of the computed F-parameters, are in *fully continuous form*. However, in actual writing the pen should be lifted off the paper in certain places therefore we need to eliminate certain joining lines or "segments" from the original F-plots for the calligraphic effects to become clear.

DF-plot (Discrete Form F-plot): This is the resulting F-plot after omission of the selected segments from the fully continuous form CF-plot.

QGCC (Quran Generated Computed Calligraphy): This is the final calligraphy observed after adjusting the aspect ratio and the line thickness in the above DF-plot which shows the Output Name in its ultimate calligraphic form. However, as we shall see later, for some names the whole original F-plot (CF-plot) without omitting any segments can be used to observe the QGCC.

In most of the cases that we will observe in this article the Input and the Output names are the same but there are other situations too, so we categorize the QGCCs as in the following:

Exact Match QGCC:

The Input Name and the Output Name QGCC are exactly the same.

Identical Match QGCC:

The Input Name and the Output Name QGCC are not the same but are alternative names of the same individual.

(MLF) NV Match QGCC:

The Input Name and the Output Name QGCC are neither exactly nor identically the same but have the same MLF made Natural Variation (have same NV and thereby same SV and thereby same F-plots).

We will soon see examples of these different type computed calligraphies

It was said before that calligraphic effects in Quran are best observed when the line thickness and the aspect ratio in their relevant F-plot have been adjusted to have some optimized values. It should be noted however, that these optimized values are not ultimate. For example, the width of a graph can arbitrarily be extended or contracted to some extent without inducing much change in the observed calligraphy (QGCC).

All graphs and QGCCs in this article are plotted using the Microsoft Office excel (see Appendix D for the important plot settings). It is in fact an interesting point that features and options provided in this popular software can uniquely produce such impressive calligraphic effects. We have already discussed in the CS-article, based on the observations presented in that article, that The Author of Quran must have a precise and detailed knowledge of the technological and scientific state of humans at anytime in the future. Of course, discovery of Quran's mathematical-computational effects must have been synchronized with a certain level of scientific and technological capability of humans which would enable them to detect and observe the effects.

5. The Computed Calligraphy of Arabic Names in Quran

We will soon encounter some impressive works of calligraphy in this article that would be very hard to believe that they are not produced by human artists. These calligraphies are in fact results of a superbly intelligent quantitative control of the frequencies of letters in chapters of Quran. In order that the reader gets a sense of the complexity and precision of the mathematical-computational design of Quran needed to yield these calligraphic effects, in Table 2 we show the steps in generation of these calligraphies (see the CS-article for the details).

Table 2.

Step 1	Step 2	Step 3	Step 4
Using the MLF method construct the Natural Variation (NV) of the Input Name in Quran	Construct the Sorted Variation (SV) of the NV obtained in Step 1	SF-analyze the SV of Step 2 and use its computed F-parameters to make CF/DF-plots	Observe Output Name QGCC by Optimizing the AR, and the LWR, in the CF/DF-plots

Compute-plot algorithm for generating a Computed Calligraphy in Quran through 4 main steps

As a routine procedure particularly in Figure 28 to 55, which are presented in pair figures, we shall show both CF-plot and DF-plot in the same graph on the top. In the top graph, CF-plot is shown as contained in a "main rectangle" and the DF-plot is distinguished with yellow color as "rectangular subdivisions" inside the main rectangle. The final Calligraphic form of the DF-plot which is the Output "QGCC" will be presented at the bottom after aspect ratio and line width adjustments are done. In the bottom QGCC, the omitted segments of the CF-plot will be specified by their J values printed in red across the relevant F-parameter in the parenthesis. These omitted segments are observable as white color rectangular subdivisions inside the main rectangle in the top graph. For example, alpha **(54-64, 106-end)** in QGCC of Figure 22, means that connecting lines (segments) in its relevant CF-plot have been omitted from J= 54 to J=64, and omitted again from J=106 to 108 (end).

For a more clear recognition of letter domains in the CF-plots and to better sense the artistic impact of QGCCs, in general larger size graphs for both CF-plots and plots of QGCCs have been used in this article.

We will now proceed to present a much clearer picture of the QGCCs, this time with inclusion of segment omissions from the CF-plots, starting with the name Muhammad again.

5.1 Quran Generated Computed Calligraphies Observed for the Input Name "Muhammad"

In the bottom plots of Figure 20, we observed the calligraphies in their fully continuous form (CF-plots) but after omission of very few segments the following impressive QGCCs can be observed. It must be reminded that in all the upcoming computed calligraphies absolutely no segments will be added to the F-plots but only some segments will be omitted from the original F-plots and this can be considered as a normal act equivalent to lifting the pen off the paper in actual writing with the hand.

In all following QGCC plots the name connected to the F-parameter is the Input Name (indicated in the graph with blue color). The Output Name Computed Calligraphy QGCC (also indicated with blue color in the graph) is clearly observable with its adjusted AR and LWR in full black color.

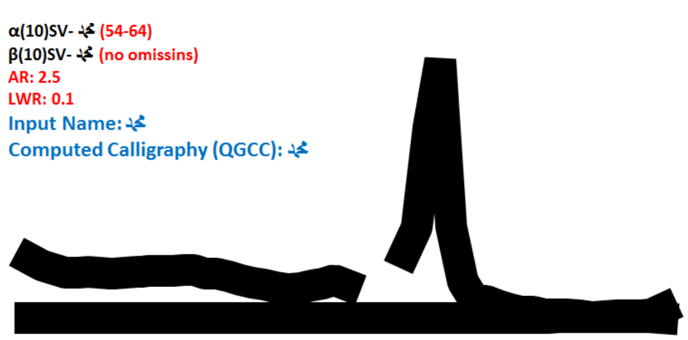


Figure 21. Exact Match, Muhammad محمد to Muhammad محمد Quran Generated Computed Calligraphy (QGCC) computed in base B=10, as observed from its simultaneous alpha&beta DF-plots

Figures 21-23, show how choice of the omitting segments and also the base B used for computing the F-parameters has produced different Output Name QGCCs. Observe from Figures 21-23, that while in base 10 DF-plot has uniquely produced the Output Name (Exact Match) QGCC " محمد ", in base e both Output Names (Exact Match) QGCCs " محمد " and also (Identical Match) QGCC "احمد" can clearly be observed, depending on the choice of the omitted segments in their F-plots.

In Figure 21, for the QGCC computed in base 10, we see a clearly spelled "Muhammad" after elimination of the connection lines between J=54 and J=64 from its relevant alpha CF-plot (top right graph in Figure 20).

Figure 22. Exact Match, Muhammad محمد to Muhammad محمد Quran Generated Computed Calligraphy (QGCC) computed in base B=e, as observed from its simultaneous alpha&beta DF-plots

In Figure 22 for the QGCC computed in base e, after eliminating the last connecting segments of both alpha and beta from J=106 to J=108 (top left graph in Figure 20), we see again another Output Name "Muhammad", only with a different shape letter "mim" in the start.

In Figure 23, for the QGCC computed in base e, although its CF-plot is exactly identical with that of Figure 22, we can see a clear Output Name QGCC "Ahmad" when eliminating segments of alpha and beta are chosen to have the values specified in Figure 22. So while Figures 21 and 22 show Exact Match QGCCs of "Muhammad to Muhammad", Figure 23 shows an Identical Match QGCC of "Muhammad to Ahmad".

Quran Generated Computed Calligraphies (QGCCs) presented in Figures 21-23, particularly Muhammad محمد to Muhammad محمد in Figures 21-22, show in fact three very impressive computed calligraphies in Quran, surpassed perhaps only by another QGCC, that of "Ahmad" to be seen in Figure 27. No human-made calligraphies could be found through the web searches done by this author that can compare with these three uniquely styled QGCCs of the names Muhammad and Ahmad. In all these three QGCCs only letter "dal" is used by Quran in a shape which is somewhat similar to a human-made Arabic Font (Andalus) " د".

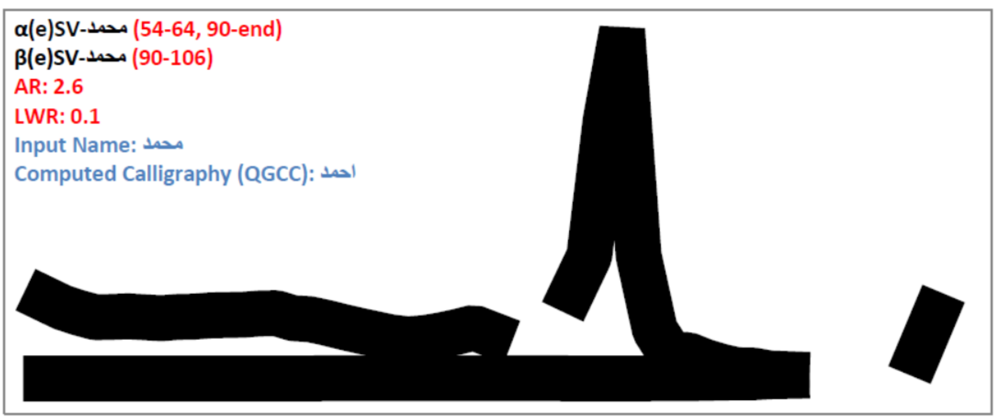


Figure 23. Identical Match, Muhammad محمد to Ahmad احمد Quran Generated Computed Calligraphy (QGCC) computed in base B=e, as observed from its simultaneous alpha&beta DF-plots

5.1.1 Base Dependence of the DPW Calligraphic Effects

We have just seen from Figures 21-23, the crucial base dependence of the Output Names in computed calligraphies of α&β F-plots. This is quite expected since α =1/β and this will affect in particular, the terminal point relative values of the two F-parameters depending on the base used in the regression computations. Notice that the terminal points in these graphs (final J values) determine the shape difference between "alif" and "mim" i.e., the difference between "**احمد**" and "**محمد**". To better see this effect, observe in Figure 24 α&β F-plots of the same Input Name "Muhammad", where F-parameters have been computed in four arbitrary bases B=1.2, 1.4, 20, and 50. In the two left graphs of Figure 24, the final beta values have produced very tall "alifs" which are not suitable for showing "alif" in an Output Name QGCC "**احمد**", while in the two graphs on the right side, letter "mim" will not be detectable when the line thicknesses are increased and therefore QGCC of "**محمد**" cannot be observed for B=20 and B=50.

It is therefore seen from these graphs that a well proportioned QGCC for the Output Names Muhammad and Ahmad cannot be observed for just any arbitrary B value. In other words, it seems that the mathematical-computational structure of Quran has been so configured to yield the best calligraphic exhibition of these names only when the two popular logarithmic bases **e** and **10** are used in regression computations. We must therefore keep in mind the importance of such base dependencies for all DPW generated QGCCs including those for the oncoming Arabic names Ahmad and Mahdi, and non-Arabic names Stephen and Edward.

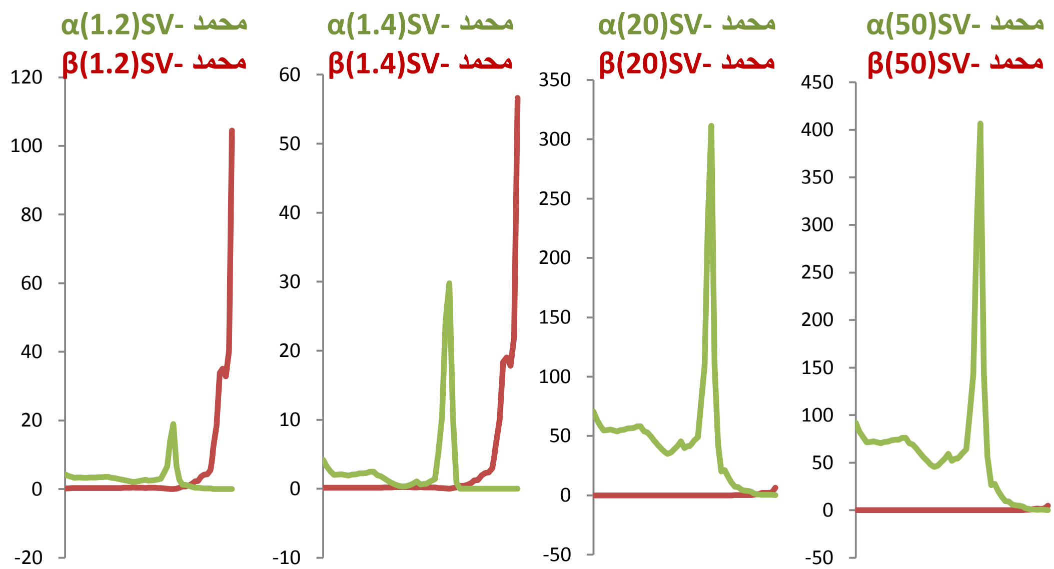


Figure 24. DPW generated α&β F-plots for the Input Name Muhammad, as computed with different indicated base values. J values on the x-axis are not shown in these F-plots but positions of the peaks and the terminal points are exactly the same as those of the F-plots computed in bases e and 10 in Figures 10 which can be used for comparison purposes

5.2 Quran Generated Computed Calligraphies Observed for the Input Name "Ahmad"

In Figure 25, α & β F-plots of the Input Name Ahmad "**احمد**" in Quran computed in both bases e and 10 are shown. Again, like in Figure 20, the bottom plots here show with thickened lines and with omitting all other indicators, those CF-plots lying right above them. As a matter of routine practice from here on in this article, without showing any intermediate steps only the final adjusted graph exhibiting the calligraphic Output Names QGCCs will be shown. Also, similar to Figure 20 and for better observation of the calligraphic effects, line colors in the final QGCC plots will be shown in full black color.

Figure 26 shows two different versions QGCCs of Output Name Muhammad, obtained from DF-plots of Figure 25 each with different omitted segments. These Output Name QGCCs "Muhammad" that are both generated from the same Input Name "Ahmad" are clearly in sharp contrast with those "Muhammad" QGCCs observed in Figures 21-22, which is indicative of their independent mathematical engineering in Quran.

Notice the interesting point that here too with the Input Name Ahmad, just as was observed for the Input Name Muhammad in section 5-1, while α&β F-plots in base 10 uniquely exhibit the Output QGCC of "محمد", QGCCs in base e show both Output Names "محمد" and "احمد". However, here in Figure 26, the shape and proportions of QGCCs (ARs and LWRs) are distinctly different from QGCCs of "محمد" in Figures 21-22. The similarities and differences of the QGCCs are interesting to note here, considering the relatively small differences between the two MLF made NVs for the Input names Muhammad and Ahmad (see Appendix B, Table B1).

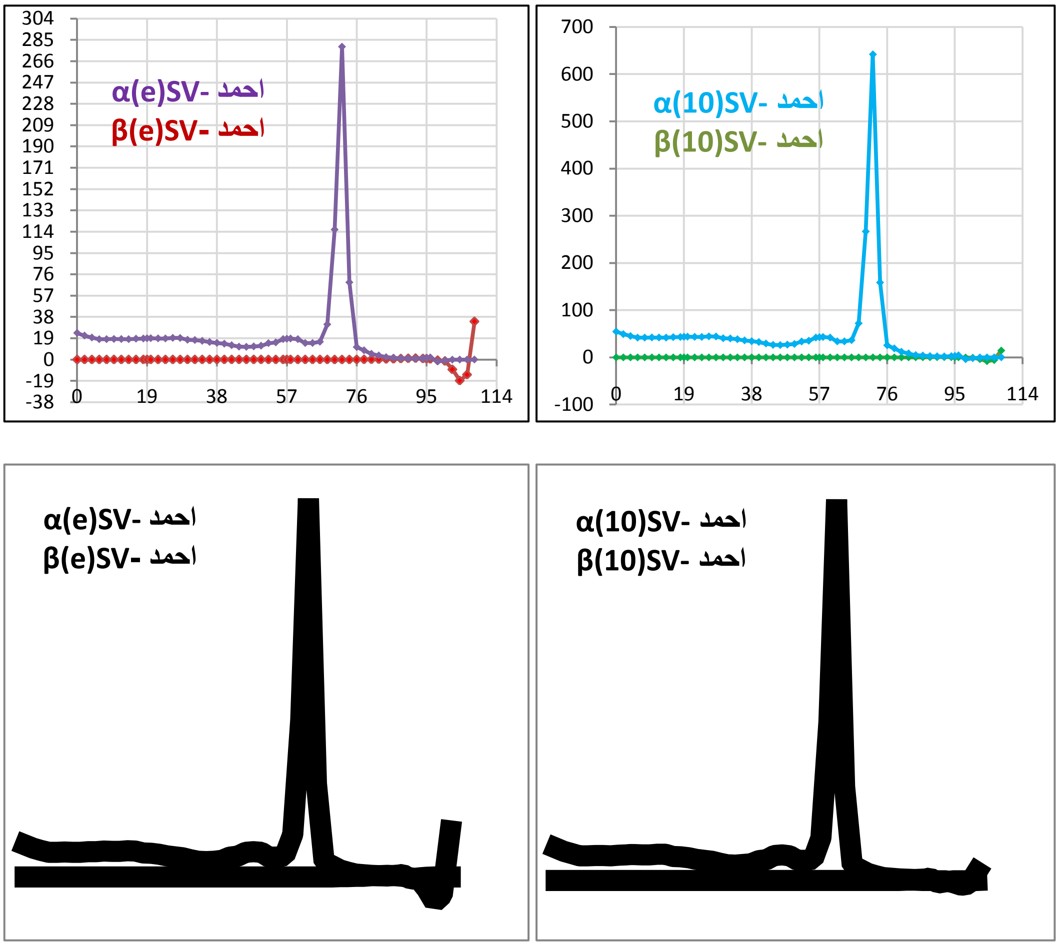


Figure 25. Quran Generated Computed Calligraphies (QGCCs) for the Input Name Ahmad احمد, as observed from their alpha&beta F-plots computed in both bases e and 10 (observed in fully continuous form CF-plots)

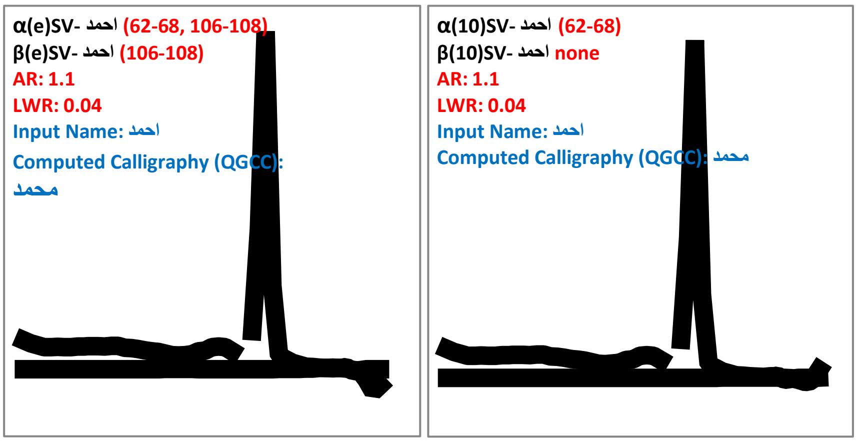


Figure 26. Two Identical Matches, "Ahmad احمد to Muhammad محمد" Quran Generated Computed Calligraphies

(QGCCs), computed in bases e and 10 both showing the same Output Name QGCCs Muhammad but with different shapes of letter mim in the start (both made from DF-plots of their top CF-plots in Figure 25)

Observe now in Figure 27, after omission of the specified segments from its original CF-plot (Figure 25 top-left), and after adjusting the aspect ratio and the line width, the amazing appearance of a unique calligraphy of the name "Ahmad" (see making steps of this exceptional QGCC in appendix D).

The Exact Match QGCCs "Ahmad to Ahmad" shown in Figure 27 and "Muhammad to Muhammad" shown in Figures 21-22, represent the most impressive Computed Calligraphies so far observed in Quran. These QGCCs reflect simultaneously geometric simplicity and a modern style artistic elegance having resulted from astonishing mastery of computation combined with artistry of The Author of Quran. No human produced calligraphies of these names could be found resembling anything close to these works of computed art. In particular, the name Ahmad which has been mentioned only once in Quran seems to have been given a one of a kind treatment for its elegant calligraphic appearance as can be seen from Figure 27.

Notice also, that the same arguments of DPW optimized design that holds for the Input Name Muhammad, also holds valid in this case. In other words, proportionalities and calligraphic effects of these QGCCs are optimized for best observational impact only when popular logarithmic bases B=e, and B=10 are used.

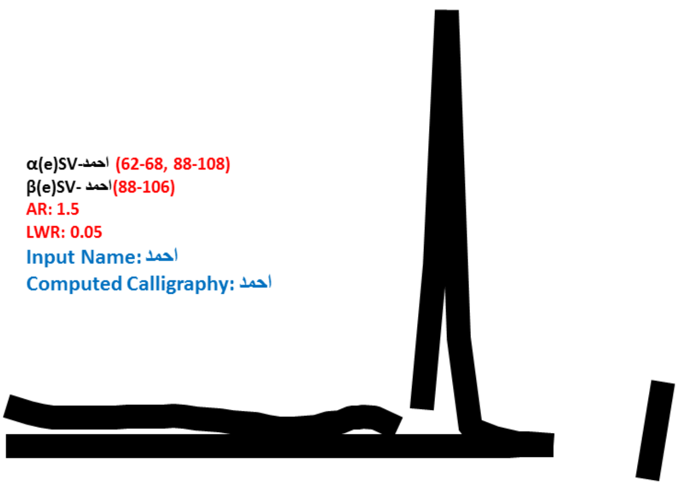


Figure 27. Exact Match, Ahmad احمد to Ahmad احمد Quran Generated Computed Calligraphy (QGCC) computed with B=e, as observed from its simultaneous alpha&beta F-plots; a contemporary style masterpiece of the Computed Calligraphy and a magnificent tribute from The Author of Quran to His Final Messenger (ص)

5.3 Quran Generated Computed Calligraphy Observed for the Input Name Jesus " عیسی"

In Figure 28 on the top, the CF-plot of alpha(e) computed for the Input Name Jesus "عیسی" in base e is shown in its main rectangular frame. This is a repeat of Figure 12 but it shows through yellow colored rectangular subdivisions, not only the DF-plot but also different J values or regions corresponding to the letter composition of the name Jesus. As it was noted in section 4, for SPW generated F-plots which happen to represent most of the calligraphic effects in Quran, absolute values of the F-parameters are not important and only their relative values are used for creation of the calligraphic manifestations. In other words, contrary to the DPW F-plots which are clearly base-dependent, in SPW generated F-plots adjustability of the aspect ratio makes their B dependence unimportant in formation of the final QGCC. So, although in Figure 28 and other upcoming Figures we show the base dependence of the F-parameter, for instance alpha(e) in this case, the specific base used in the SF-analysis for the SPW generated QGCCs is unimportant. Note also that as it was mentioned before and except for QGCC of Noah which will be seen as an exception, all Arabic letters which have points in them will appear as "pointless" (dot-less) in their QGCCs in this article, due again to SPW limitations (e.g., ف, ت, ن, ب).

In the bottom graph of Figure 28, the Output Name "Jesus" in seen in its calligraphic form QGCC which has been plotted based on the DF-plot observed on its top. Here Quran has used letter ain "ع" in its Isolate form (see Table 4) and as a separated letter in the start. This is also a case of Exact Match QGCC of, Jesus to Jesus ع یسی. This particular separation of the starting letter which in this case is employed by Quran is also observed in human written calligraphies as can be seen from Figure 57E and Table 5. Notice also that, here only a very short segment J=92 to J=95 has been omitted from the top CF-plot to produce the final Output Name QGCC of Jesus

ع يسى. The particular shape of letter ain chosen by Quran which in spite of SPW limitations clearly resembles the letter "ain", is also interesting to note in this QGCC. We shall have a detailed discussion of letter forms and shapes used by Quran in its Computed Calligraphies in section 8.

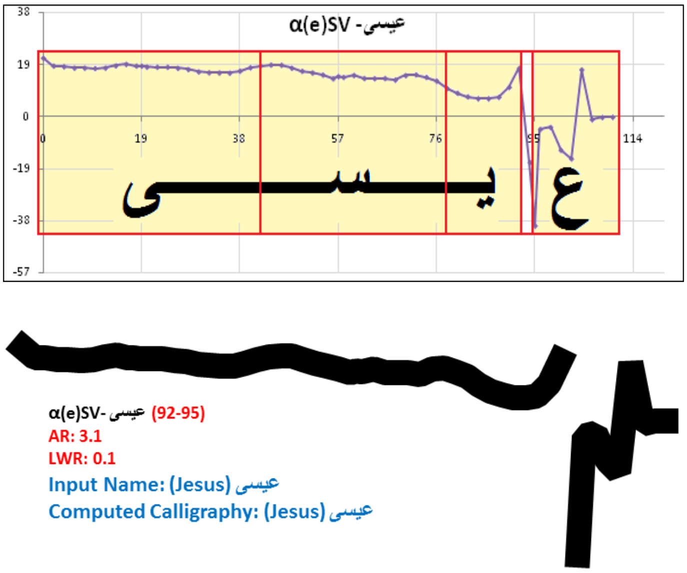


Figure 28. Exact Match, Jesus عيسى to Jesus ع يسى Quran Generated Computed Calligraphy (QGCC) as observed from its alphaSV F-plot

In the top graph, the main rectangle shows the CF-plot and the yellow colored rectangular subdivisions (inside the main rectangle) show the DF-plot. The white color rectangular subdivision inside the main rectangle shows the omitted segment.

As was noted before, from Figure 28 on, we shall routinely present Computed Calligraphies of Quran through such double Figures having the following format:

On the top, the F-plot (CF-plot) of the Input Name, as it was shown in the previous sections 2-1-1, 2-1-2, will be repeated but with marked graph points and also with the addition of a main rectangle divided into rectangular subdivisions. The colored rectangular subdivisions identify the DF-plot and also show the one to one correspondence of the letters of the Output Name QGCC with a printed version of it, printed in that same graph using the Font "Arial Font Arabic".

In the bottom graph, The Output Name QGCC of the top DF-plot is printed in the Calligraphic form, that is with adjusted Aspect Ratio AR, and adjusted Line Width Ratio LWR.

5.4 Quran Generated Computed Calligraphy Observed for the Input Name Christ "مسيح "

Figure 29 which is the repeat of Figure 13 shows on the top, the F-plot of alpha(e)SV computed for the Input Name Messiah or Christ "مسيح". This Figure also shows in fully continuous form, printing of the Output Name Jesus in Arabic but in a completely different style from the QGCC of Figure 28.

Figure 29 in the bottom shows Quran Generated Computed Calligraphy or the QGCC Output Name "Jesus عيسى" which has resulted from adjusting the aspect ratio and line thickness in the top DF-plot. Here Quran shows letter ain "ع" in its Initial form followed by a Medial form yeh followed by a Medial form (or in Nastalique calligraphic form) sin (see Table 4). This QGCC of Jesus terminates with an extended calligraphic yeh. This type of calligraphic yeh or a very similar version of it is also observed in human written calligraphies (see Figures 57J and 57H, also see Table 5). Notice that in this QGCC of Jesus no segment has been omitted and the full continuous form CF-plot has been used for making the ultimate QGCC.

This is also another example of an Identical Match QGCC where the Input Name (Christ) has computed a different Output Name (Jesus) but both names belonging to the same individual.

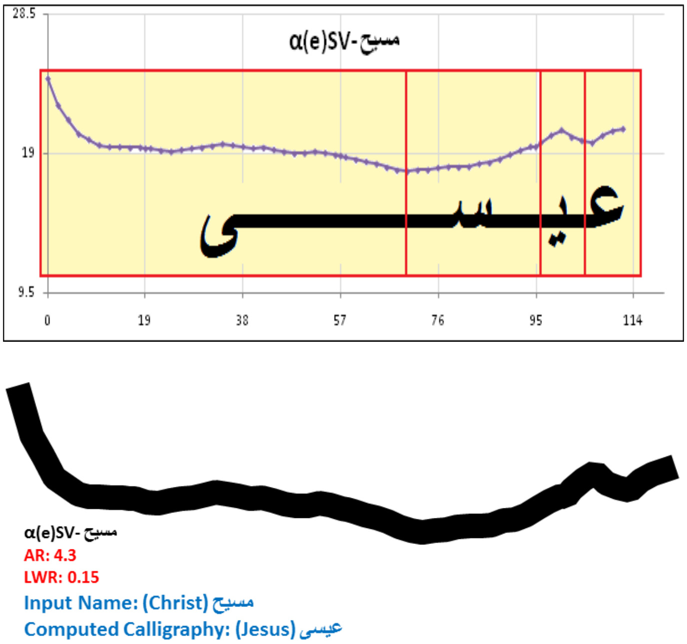
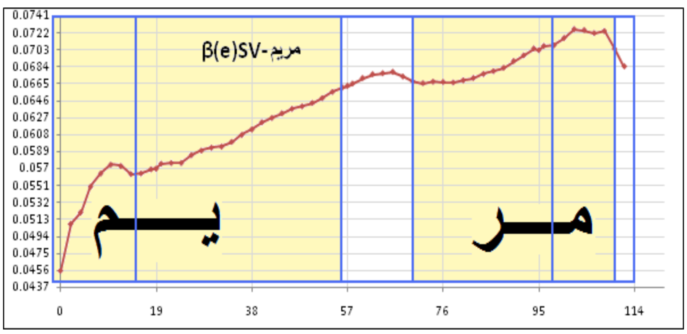


Figure 29. Identical Match, Christ مسيح to Jesus عيسى Quran Generated Computed Calligraphy (QGCC) as observed from its alphaSV F-plot (no segments have been omitted from the CF-plot for this QGCC)

Next to the names Muhammad and Ahmad which have shown six different QGCCs computed in two different bases 10 and e, Jesus and Christ with two different QGCCs have shown the highest number of calligraphies for the same individual, so far in our study of Computed Calligraphies in Quran.

Maryam مريم is the name of the mother of Jesus and a chapter of Quran has this name. In the next section we shall observe a clear Calligraphic printing of this name as well.

5.5 Quran Generated Computed Calligraphy Observed for the Input Name Maryam (Mary) "مريم "



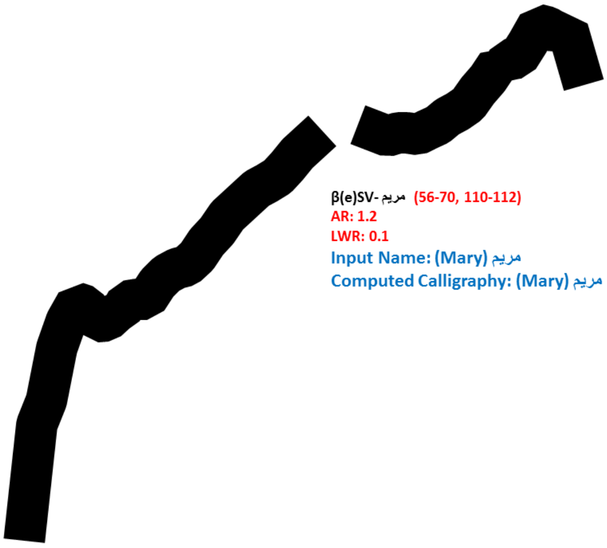


Figure 30. Exact Match, Maryam مريم to Maryam مريم Quran Generated Computed Calligraphy (QGCC) observed from its betaSV F-plot (Omitted segments shown again as white rectangular subdivisions in the top)

It can be observed from the top CF-plot in Figure 30, that even if the fully continuous form CF-plot be used without any of its segment omitted, a QGCC Output Name " مريم " would still be recognizable, only with slightly larger Initial م in the beginning and with letter ر connected to letter yeh in "yam" يم . A comparable human written calligraphy (in Nastalique) of Maryam can be seen in Figure 57O. The use of two different forms of mim as Initial and as Final in this QGCC is notable (see Table 4).

5.6 Quran Generated Computed Calligraphy Observed for the Input Name Moses "موسى "

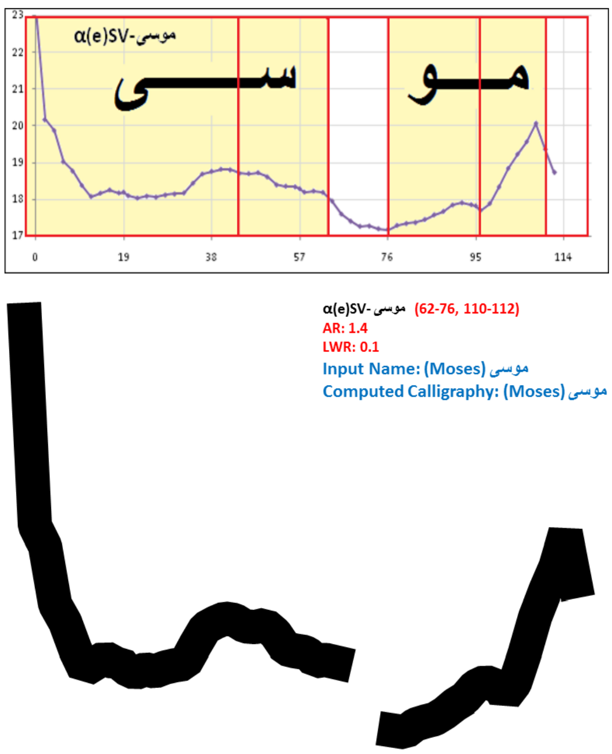


Figure 31. Exact Match, Moses موسىto Moses موسى Quran Generated Computed Calligraphy (QGCC) as observed from its alphaSV F-plot

The Nastalique form in Figure 57M can closely resemble the QGCC of Moses observed in calligraphic graph of Figure 31. Similar to the case of Maryam, it can be seen from the top graph in Figure 31, that the fully continuous form F-plot can also be used here in the case of Moses. In such case a QGCC Output Name **"موسی"** would still be recognizable in the calligraphic graph only with slightly larger Initial **م** in the beginning and with letter **و** connected to letter **س** in **سی**. A human written Nastalique calligraphy with this kind of **و** can be seen in Figure 57Q.

Although for brevity we do not show this, but a small alif (dagger alif) can also be made at the end of "Yeh **ی**" in this QGCC of Moses by omitting a small segment from its end points (from J=2 to J=4). Similarity of letter waw in Moses with waw in Noah is very interesting when this QGCC is compared with QGCC in Fgure 33.

*5.7 Quran Generated Computed Calligraphy Observed for the Input Name **Abraham** "ابراهیم "*

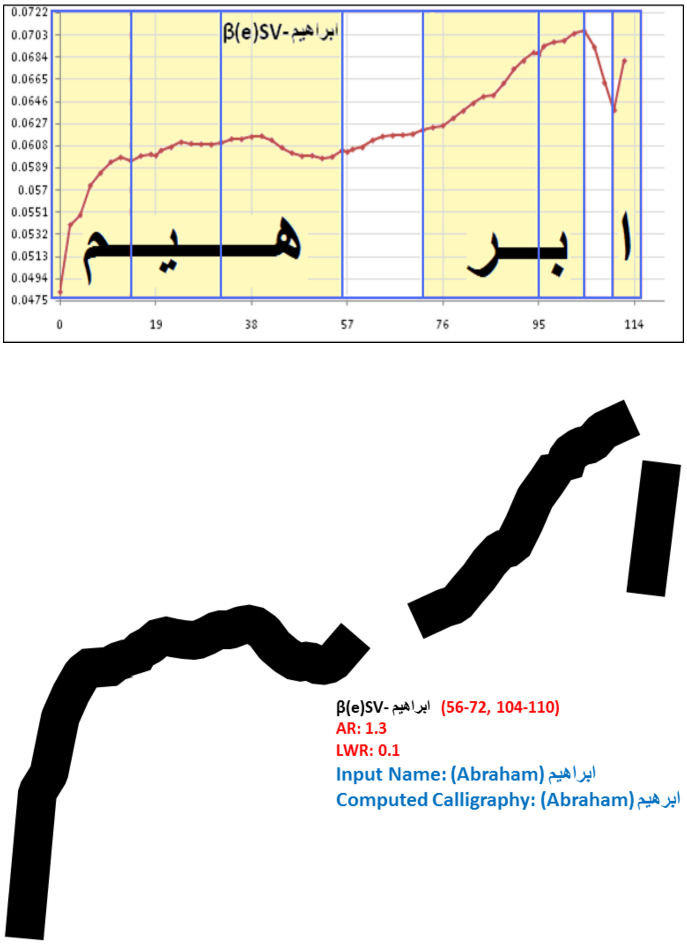


Figure 32. Exact Match, Abraham ابرهیمto Abraham ابرهیمQuran Generated Computed Calligraphy (QGCC), as observed from its betaSV F-plot.

Notice here that the Input Names **ابراهیم** or **ابرهیم**, both have the same computed Output QGCC of **"ابرهیم"** with the middle alif dropped. This dropping of alif is a common practice in Arabic where for instance, middle alif (dagger alif) is dropped in Alrahman. See also Quran.com, where the middle alif is always dropped in writing Abraham. To make a comparison with this QGCC see also, human written calligraphies of Abraham in Figure 57T, and 57R. In Figure 57F, a similar type of heh can also be observed in the human written calligraphy of **هو**.

5.8 Quran Generated Computed Calligraphy Observed for the Input Name ***Noah "نوح "***

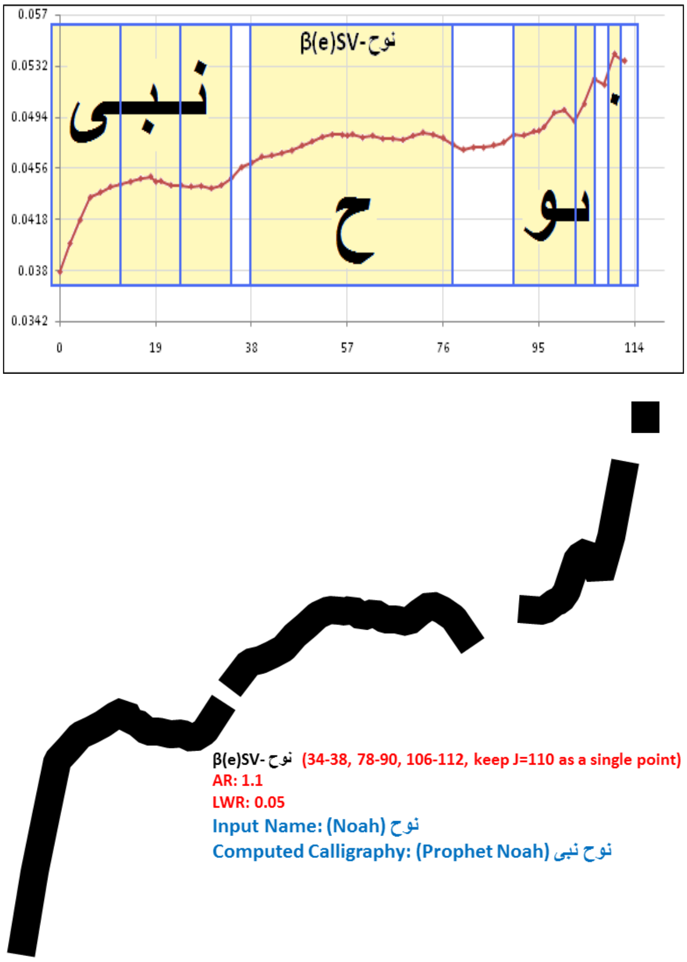
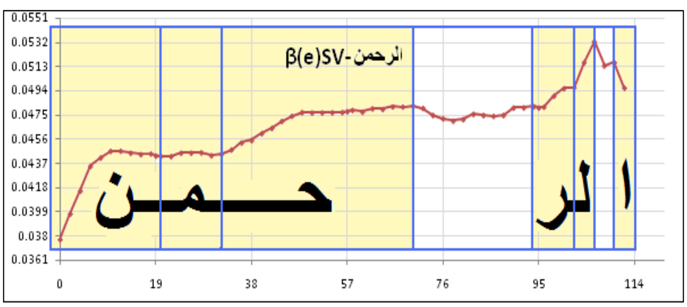


Figure 33. Exact Match, Noah نوح to Noah نوح Quran Generated Computed Calligraphy (QGCC), as observed from its betaSV F-plot

Notice the interesting addition that Quran makes in this QGCC to the name of this major prophet which is the word **"** prophet **نبى "** , a word commonly attached to the name Noah. See also Figure 57N and Table 5.

*5.9 Quran Generated Computed Calligraphy Observed for the Input Name Alrahman "**الرحمن**"*



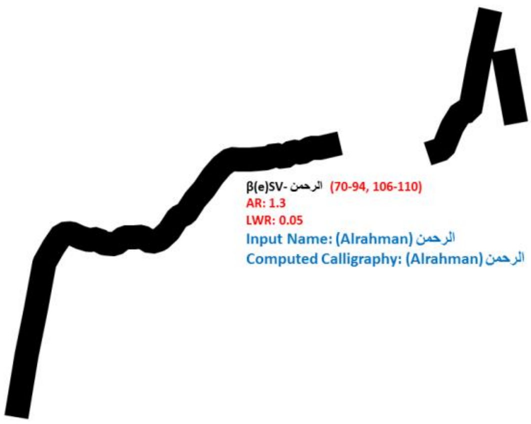


Figure 34. Exact Match, Alrahman الرحمن to Alrahman الرحمن Quran Generated Computed Calligraphy (QGCC) as observed from its betaSV F-plot

Notice from Nastalique calligraphies of Alrahman in Figure 57A, 57B, and 57C, the interchangeability of **"من"** and **" م "** in human written calligraphies of this name of God. In fact QGCCs of both Alrahman and Alrahim are very similar and are exchangeable.

Since the two names Alrahman and Alrahim both belong to God, they can also be categorized as Identical Match QGCCs for one another.

5.10 Quran Generated Computed Calligraphy Observed for the Input Name Alrahim " **الرحيم** *"*

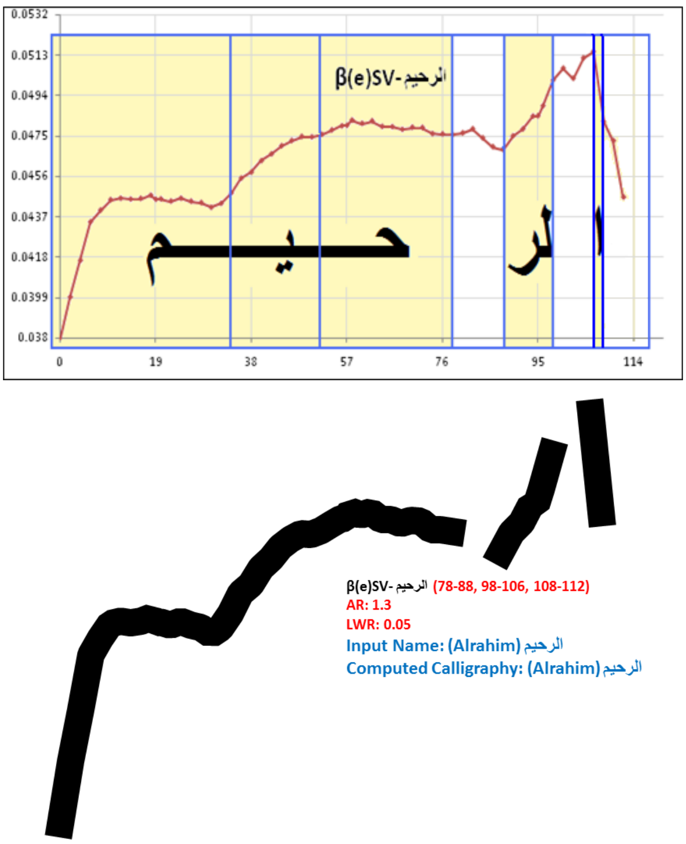


Figure 35. Exact Match, Alrahim الرحيم to Alrahim الرحيم Quran Generated Computed Calligraphy (QGCC) as observed from its betaSV F-plot

This Alrahim Output QGCC has a similar shape to that of Alrahman QGCC shown in Figure 34, but is clearly different in details which shows its independent engineering. The small difference between the two MLF made Natural Variations of these two names can also be observed from Table B1of Appendix B.

Interchangeability of the two names Alrahman and Alrahim as stated in the previous section (Figure 34), is again observable from Figure 35, when compared again with Figures 57A, 57B, and 57C.

5.11 Quran Generated Computed Calligraphy Observed for the Input Name Ali " على "

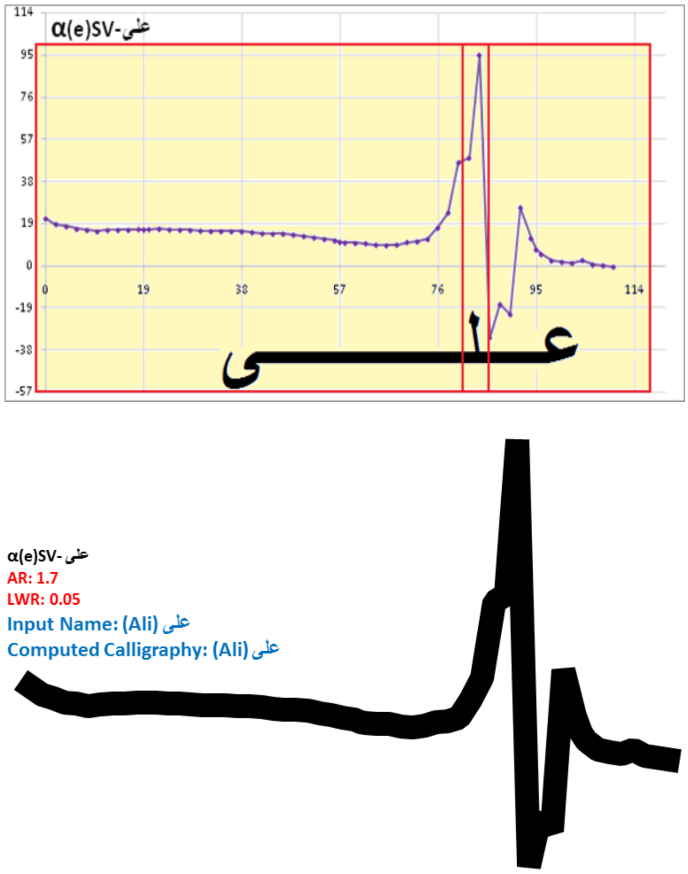


Figure 36. Exact Match, Ali على to Ali على Quran Generated Computed Calligraphy (QGCC) as observed from its alphaSV F-plot

This is another impressive and uniquely styled QGCC which shows with amazing clarity and through its fully continuous form CF-plot, the Output Name Ali على. Notice the unmistakably clear combination "لى " and the unique shape of letter ain used by Quran, all letters written of course in accordance with the SPW limitations.

5.12 Quran Generated Computed Calligraphy Observed for the Input Name Hayy " حى "

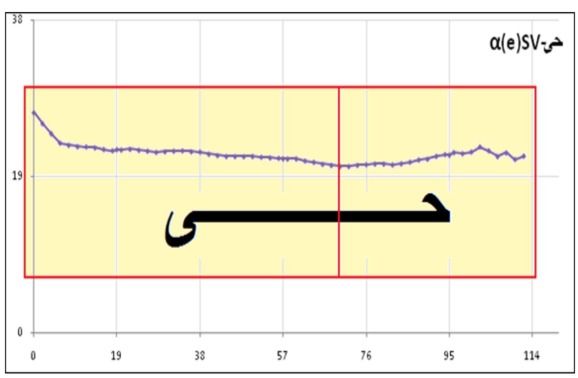


Figure 37. Exact Match, Hayy حى to Hayy حى Quran Generated Computed Calligraphy (QGCC) as observed from its alphaSV F-plot

This is QGCC of another one of God's names, “Hayy حى” (Ever Alive) which has been made through using the fully continuous form CF-plot of its F-parameter alpha. Notice the similarity of this computed calligraphy with the human made Nastalique calligraphy of the same name "Hayy" shown in Figure 57H, with the difference that here letter "yeh" has been rotated clockwise about 40 degrees, as compared to its counterpart in Figure 57H.

Observe from Hayy in its QGCC, the adopted visual code of Quran for writing letter "ha ح" in SPW writing of this letter of alphabet. Notice how Quran here uses with amazing consistency, the same shape for letter "ha ح" as has been used for "Noah" seen in Figure 33, and for "Al-rahman" and "Al-rahim" seen in Figures 34 and 35, and for "Hasan" to be seen in Figure 40.

5.13 Quran Generated Computed Calligraphy Observed for the Input Name Fatima " ***فاطمه*** *"*

Figure 38. Exact Match, Fatima فاطمه to Fatima فاطمه Quran Generated Computed Calligraphy (QGCC) as observed from its alphaSV F-plot

Input Name " Fatir فاطر " generated an Output Name Fatima فاطمه and it was immediately verified that the Input Name فاطمه also produces Output Name QGCC Fatima. This clearly meant existence of an Exact Match Fatima to Fatima QGCC. Notice in particular, the combination "مه" in فاطمه where letter "heh" has the exact shape of this letter in human produced calligraphies written in Tholth style (Figures 57G and K , and Table 5).

5.14 Quran Generated Computed Calligraphy Observed for the Input Name Ghafir " غا فر "

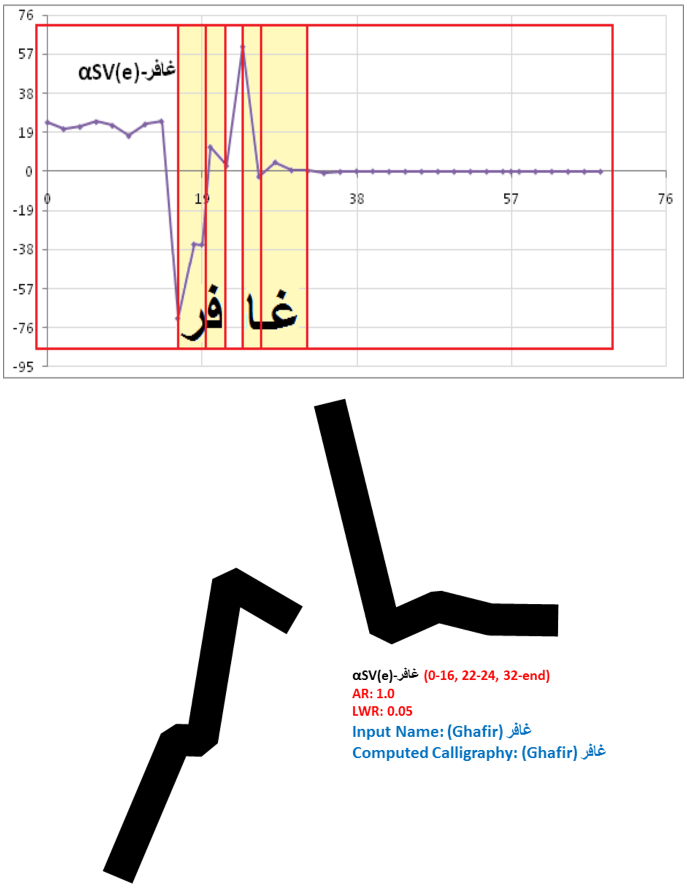


Figure 39. Exact Match, Ghafir غا فر to Ghafir غا فر Quran Generated Computed Calligraphy (QGCC) as observed from its alphaSV F-plot

In the following we will show interesting QGCCs of two other famous Arabic names which will help further confirm alphabetic coding of Quran for letters ha, heh, mim, dal, nun and sin in its Computed Calligraphies.

5.15 Quran Generated Computed Calligraphy Observed for the Input Name Hasan " حسن "

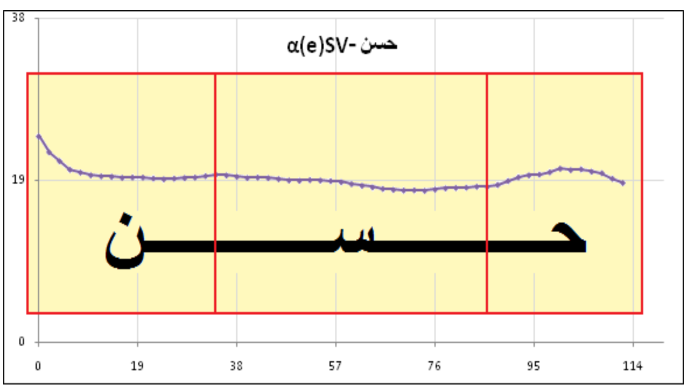


Figure 40. Exact Match, Hasan حسن to Hasan حسن Quran Generated Computed Calligraphy (QGCC) as observed from its alphaSV F-plot

Compare this QGCC to Figures 57P and also notice the similar shape of ha, as was mentioned before, with those in QGCCs of Hayy, Noah, Alrahman, and Alrahim.

5.16 Quran Generated Computed Calligraphy Observed for the Input Name Mahdi **" مهدی "**

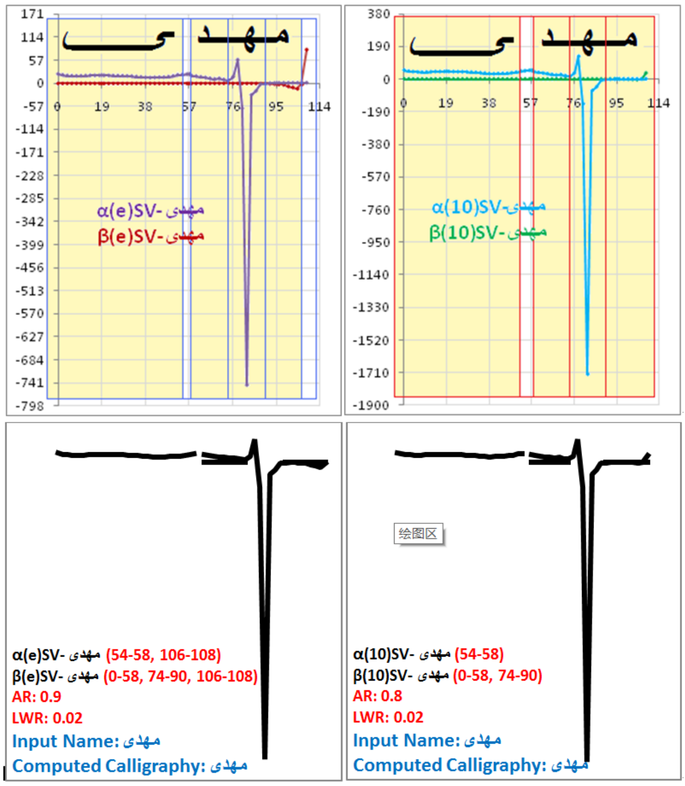


Figure 41. Exact Match, Mahdi مهدی to Mahdi مهدیQuran Generated Computed Calligraphy (QGCC) as observed from its DPW alpha&betaSV F-plot

Notice here the astonishingly accurate portrayal of Quran for letter heh, although in an exaggerated form. Letter heh which is seen between J=74 and J=90, exactly has the shape of a commonly used Medial form "Goal heh" Unicode FBA9 (see Table 4). Here, as a result of the vertical stretching of letter heh, the combination "**مهد**" appears in the interesting shape of a long sword pointed downward. Letter yeh on the other hand, looks like an extended calligraphic Nastalique yeh (see Table 5) which has rotated to some degrees making it look horizontal.

6. Quran and Physics

In the CS-article NBFS marking in Quran of the names of five prominent physicists, Josef Fourier, Carl Gauss, Leonhard Euler, Rene Descartes and Isaac Newton was shown. These have all been mathematician-physicists (theoretical physicists) with fundamental contributions to physics, mathematics and science in general. As for the reason, it was explained in that article that these individuals have been NBFS marked in Quran because the NBFS quantitative construct of Quran has been built upon such mathematical concepts that Quran knows, with its precise futuristic vision that will be introduced to the world by these scientists. NBFS markings were in fact recognized as part of an ingenious mathematical scenario of Quran, with these physicists as its players, to convey some important messages to the future advanced generations of humans. In addition, it was speculated in the CS-article that Quran by marking certain scientists may also be showing its special attention to mathematical based sciences best exemplified by physics.

There are a group of theoretical physicists who are in search of fundamental laws and building blocks of the universe. These include in particular, particle physicists and cosmologists who are always striving often out of sheer curiosity, to find out at the deepest level underlying laws of the observable universe. Particle physicists and cosmologists constantly try between the two extremes of the smallest and the largest to come up with a "unified theory of everything" that can mathematically explain the whole of physical existence. The unusual curiosity and tireless efforts to understand the fundamentals of creation has made this group of scientists notably different from the rest. This might just be the reason why these scientists get a special attention from Quran which is always calling its readers to observe and think about creation. Such conceptions, reinforced of course also by previous observations, triggered us for the SF-analysis of the names of a number of renowned theoretical physicists in search of NBFS and QGCC effects.

Results of the SF-analysis of the Sorted Variations of names of some top ranking physicists, as will be seen in the upcoming sections of this article, proved in fact to be very interesting indeed.

6.1 The NBFS Name Markings in Quran of Some Renowned Physicists

First names of seven prominent theoretical physicists (two of them still living) who have had major contributions in our present day understanding of the physical world have been selected for SF-analyses of their names in Quran. Table 3 and its following F-plots show the NBFS markings in terms of couplings and effects observed from the SF-analysis of the MLF made Sorted Variations of the first names of these physicists in Quran (their last names are specified in parentheses).

Among the reasons for not including the names of some other physicists was the fact that there are letters in their names that do not exist in the Arabic alphabet. For example, first names Paul (Dirac) and Richard (Feynman) contain letters "p" and "Ch" which do not exist in the Arabic alphabet.

Ascribing certain first names to certain last names in this article might seem illusive and unreasonable at first, but justifications will become more evident as we proceed.

Table 3.

Name	K(e)SV	beta(e)SV	A-SV	alpha(e)SV	alpha(10)SV	observations
James Clerk (Maxwell) جیمز کلرک	(0, -0.817) (2, -1.14) AM(57, 38E+5)	(19, 0.361) Am(57, 547E+2)	M(19, 61250)	Am(19, -7.98)	(0, 51.3) Am(19, -19) m(20, 15.2) (38, 0.0532)	
Max (Planck) مکس	(2, -0.0133) (19, -0.19) (57, -0.646) (95, 91.2) AmT(108, -703E+1)	(0, 0.0456) (19, 0.057) ext (57, 0.057) Am(104, -5.7)	(76, 285E-8)	(2, 19) ext (19, 19) M(24, 19) ext (76, 3.8)	m(38, 32) AM(80, 62.7) T(108, 0.019)	
Albert البرت (Einstein)	(2, 0.38) (38, 0.114) (95, -0.57)	(2, 0.057) (76, 0.0665)	(76, 0.76) (95, 0.57)	(76, 15.2) (95, 15.2)	AM(0, 47.5) (19, 36.1) ext (38,38) ext (57, 32.3) (95, 32.3) M(88, 38) M(98, 38) M(106, 38) ext	

					Am(108, -19)	
Erwin اروين (Schrödinger)	-	(19, 0.0532) (57, 0.057) (76, 0.057) ext	AM(0, 3.61) (38, 1.9) (57, 1.9) ext (76, 1.9) (95, 1.52)	(2, 19) (19, 19) ext CV(2-62, 19)	(38, 41.8) (95, 38) CV(88-112, 38)	FC(19)
Werner ورنر (Heisenberg)	(19, 0.19) ext m(34, 0.494) (57, -0.057) (95, 0.209) Am(110, -0.19)	(2, 0.0475) (19, 0.0532) (38, 0.057) (57, 0.057) T(112, 0.057)	AM(0, 2.28) (38, 0.95) (57, 0.95)	(19,19) ext (76, 19) CV(6-106, 19) (95, 19) ext	(95, 43.7) Am(110, 38)	FC(19)
Stephen ستفان (Hawking)	(19, -0.114) M(42, -0.152) m(50, -0.741) (57, -0.57) m(78, -3.8) ext	(0, 0.0475) (38, 0.057)	(0, 1.33) (57, 0.57) ext AM(86, 4.94) (95, 3.8E-5)	(2, 19) (19, 19) ext (76, 9.5) m(78, 8.55) AM(86, 38) (95, 3.8)	(19, 43.7) (57, 38) m(78, 19)	FC(19)
Edward ادوارد (Witten)	(2, -0.38) (19, 0.684) (57, -95) ext Am(95, -57E5)	(0, 0.0437) (2, 0.0475)	(19, 1.9)	(0, 22.8) (2, 20.9) (19, 32.3) (57, 19)	m(8, 38) (19, 76)	

NBFS Couplings and effects observed for the F-parameters computed for the Sorted Variations in Quran of the first names of the specified physicists.

6.2 F-plots of the F-parameters Computed for the Sorted Variations of the First Names in Quran of the Selected Theoretical Physicists

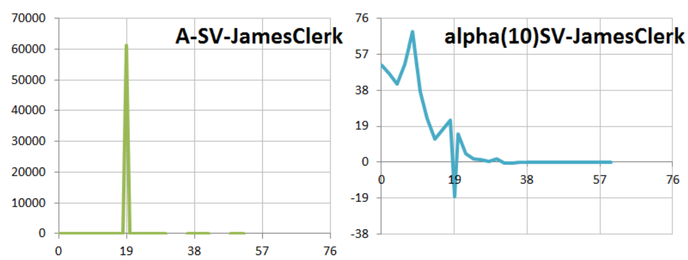


Figure 42. F-plots of the Sorted Variation in Quran of the name James Clerk جيمز كلرك (Maxwell)

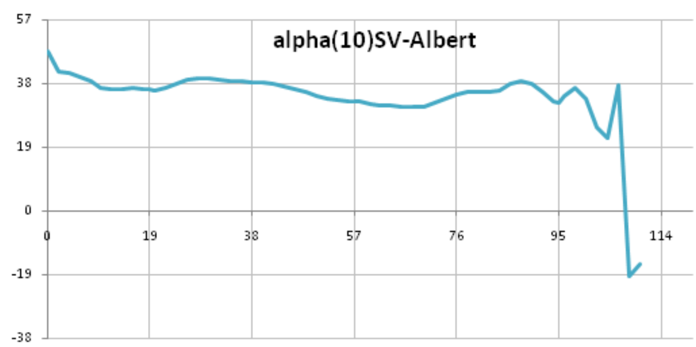


Figure 43. Selected F-plot of the Sorted Variation in Quran of the name Albert البرت (Einstein)

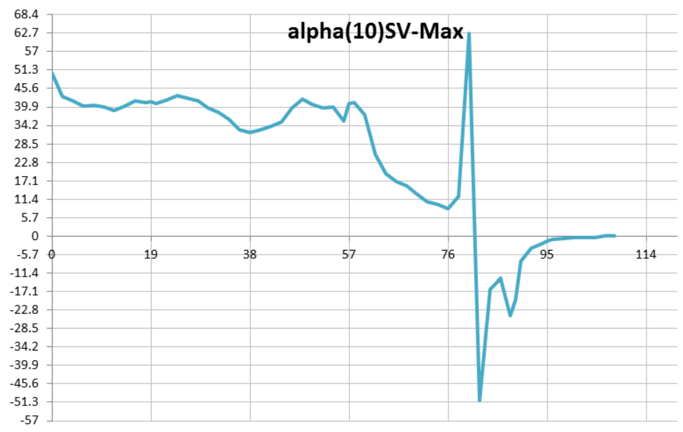


Figure 44. Selected F-plot of the Sorted Variation in Quran of the name Max مكس (Planck)

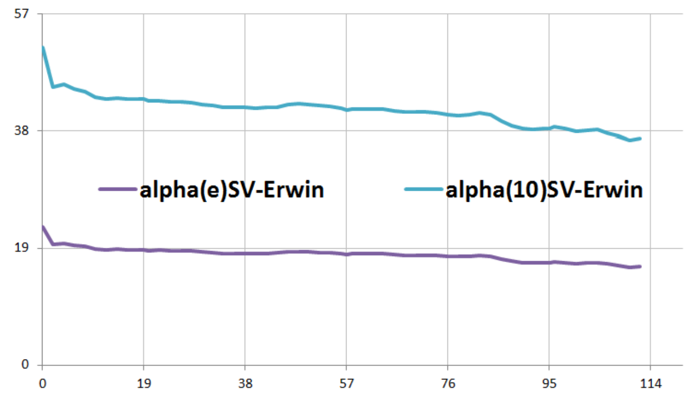


Figure 45. Selected F-plots of the Sorted Variation in Quran of the name Erwin اروين (Schrödinger)

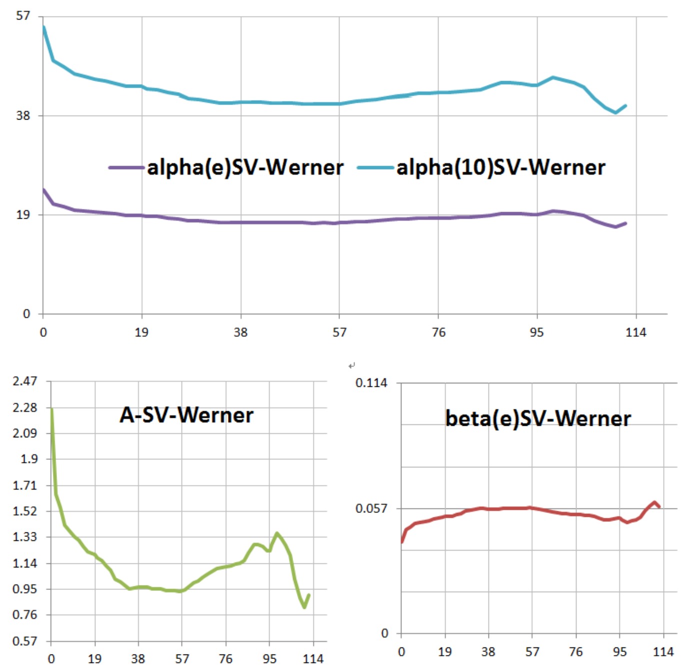


Figure 46. Selected F-plots of the Sorted Variation in Quran of the name Werner ورنر (Heisenberg)

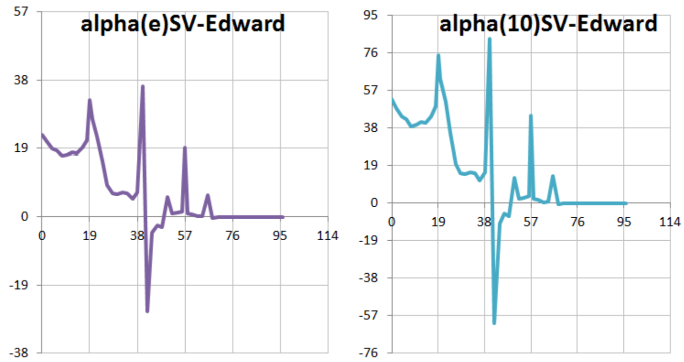


Figure 47. Selected F-plots of the Sorted Variation in Quran of the name Edward ادوارد (Witten)

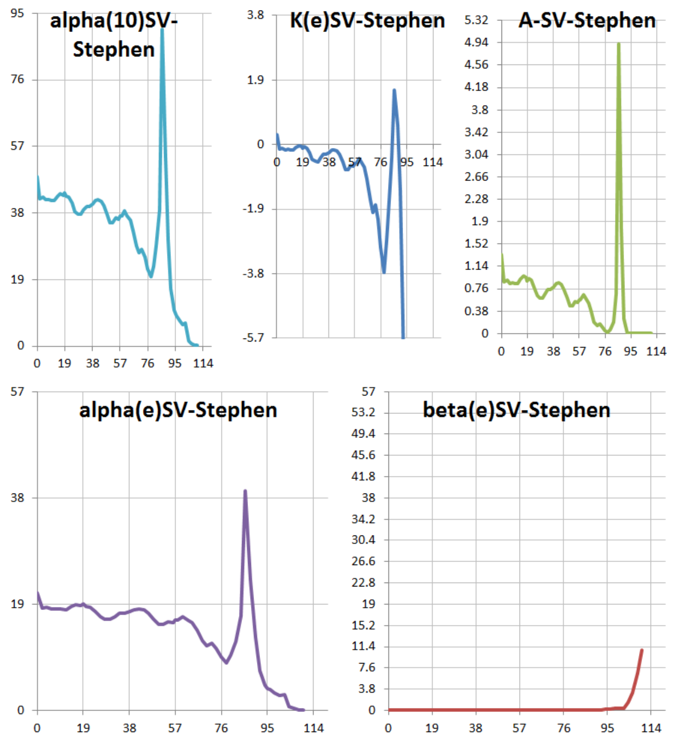


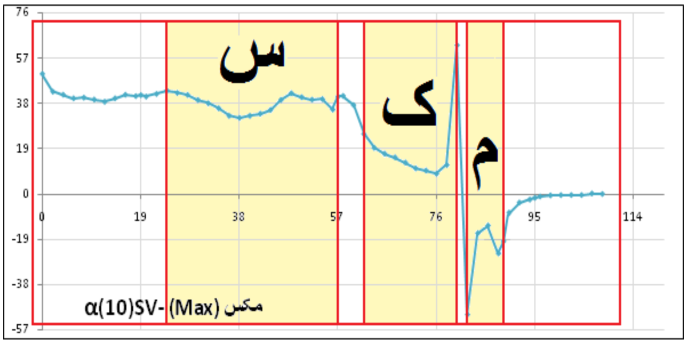
Figure 48. F-plots of the Sorted Variation in Quran of the name Stephen ستفان (Hawking)

7. Quran Generated Computed Calligraphies of Top Ranking Physicists

We will now present some interesting Quran Generated Computed Calligraphies of the names of several top ranking theoretical physicists who have had major contributions in the 20^{th} century physics. We will also try in the discussion section of this article to decode some very interesting "physics hints" from Quran through the Observed QGCCs of these theoretical physicists.

Four of the physicists whose NBFS effects have been shown in sections 6-1 and 6-2, also show pronounced calligraphic QGCC effects in the F-plots of their first names, these are: Planck, Einstein, Hawking, and Witten.

7.1 Quran Generated Computed Calligraphy Observed for the Input Name Max "مكس "



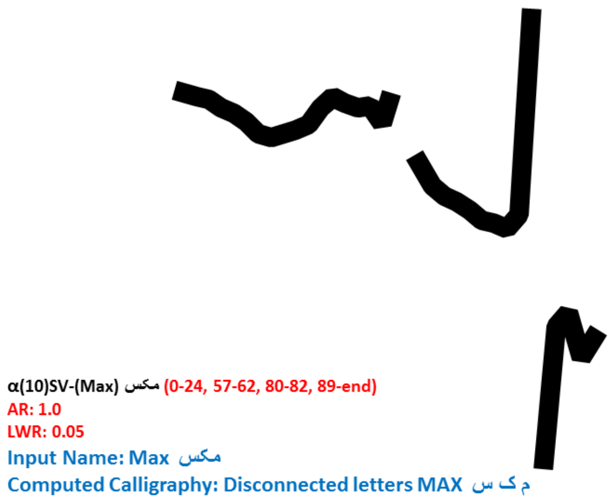
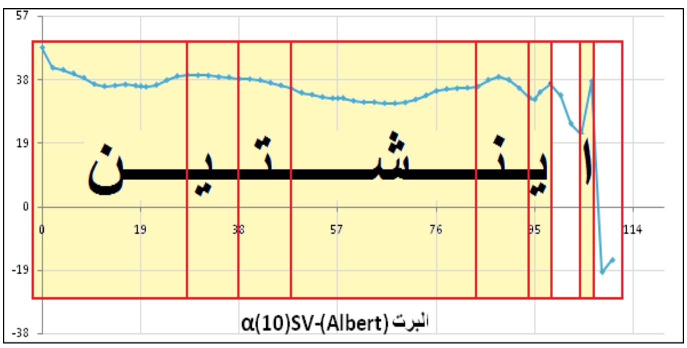


Figure 49. Exact Match, Max مكس to Max م ک س Quran Generated Computed Calligraphy (QGCC) as observed from its alphaSV F-plot, showing in discrete (separated) letters spelling of Max "م ک س"

Notice here the interesting coincidence of the terminal point in QGCC of "Max" with J=89 (see section 11-3-1).

7.2 Quran Generated Computed Calligraphy Observed for the Input Name Albert " البرت "



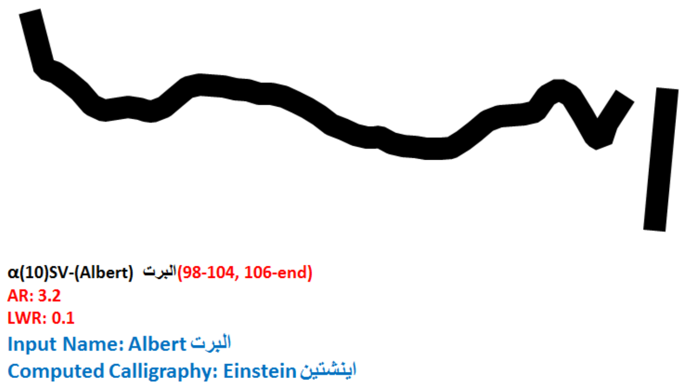


Figure 50. Identical Match, Albert البرت to Einstein اينشتين Quran Generated Computed Calligraphy (QGCC) as observed from its alphaSV F-plot

This is a truly amazing and exceptional QGCC observed for the physicists in Quran which shows an unprecedented coupling of the names. Unlike all other cases where Exact Match or Identical Match Quran Generated Computed Calligraphy of the Input Names is observed, here Quran makes an unusual coupling of the first to the last name of the renowned physicist. The Input Name "Albert" which is the first name of the theoretician generates in the Output, through its alphaSV F-plot, QGCC of his last name "Einstein"; two completely different names but when put together identifying beyond doubt, a famous Albert Einstein!

In fact, at this point in the observations we became certain that our initial presumption of special attention of Quran to physicists had more justifications than what obsession of the author with his own field of study might have induced in the course of these studies.

Notice also, that instead of J=104-106, we could have taken J=106-108 to represent letter alif in the beginning of the **اينشتين** QGCC, but then we would be having a less proportionate and taller alif in the beginning of the QGCC.

*7.3 Quran Generated Computed Calligraphy Observed for the Input Name Stephen "***ستفان** *"*

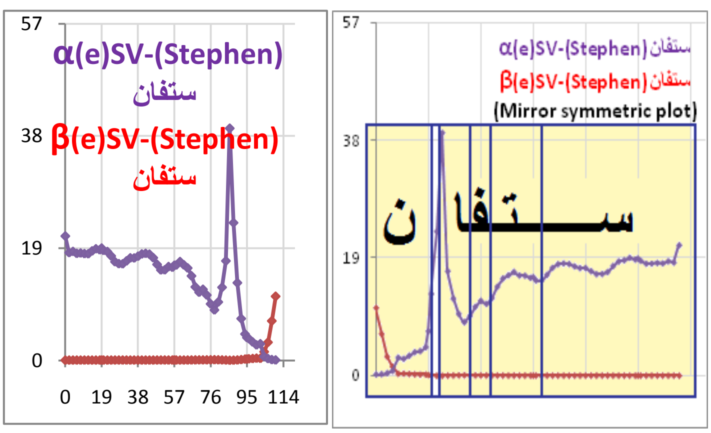


Figure 51. Alpha&beta F-plots of the Input Name ستفان seen on the left, and its letter identified mirror symetric CF-plot seen on the right

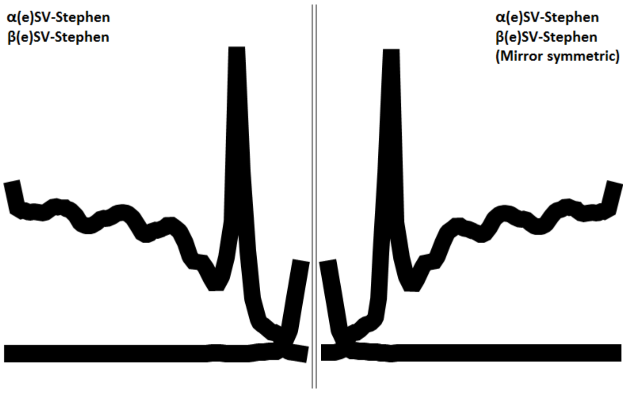


Figure 52. Calligraphic presentation of Figure 51 (in full black and with increased line widths and adjusted AR)

In Figure 51 on its left we see the original continuous form DPW of the Input Name Stephen ستفان observable through its simultaneous alpha&beta F-plots (CF-plots). The alpha&beta F-plots of Stephen (Figure 51 left) show no observable QGCC of the name but quite amazingly their mirror imge shows on their right sides, both in Figures 51 and 52, even in their fully continuous form, a clear underlined name Stephen ستفان which is printed in exact Arabic letters.

Notice that this peculiar formation which clearly showes the name Stephen has taken place when base B=e has been used for computing the F-parameters (emphasising again the importance of the base-dependence in DPW generated QGCCs, as discussed before).

In Figure 52 we see calligraphic presentations of the same CF-plots on their tops (in Figure 51). But in order to see in the final form clear QGCC of Stephen ستفان , the mirror symetric F-plot on the left side of Figure 52 has been used to produce Figure 53 (after specified segment omissions and after AR and LWR adjustments).

The name "Stephen" amazingly shows a super calligraphy in the non-Arabic names and presents a remakablely clear and stylish Quran Generated Computed Calligraphy.

Notice also, that all variants of Arabic spelling of Stephen such as استفان , استفن , or even استیفنgenerate the same F-plots because alif and yeh are non-contributing letters in making of these F-plots (they all have the same NV and thereby the same SV).

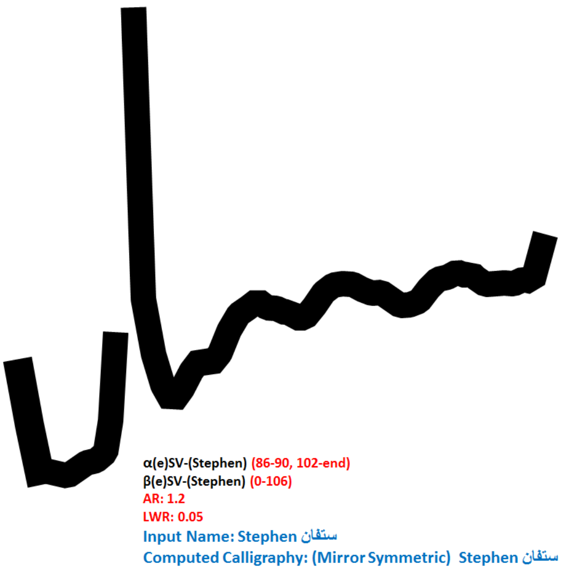


Figure 53. Exact Match, **Stephen ستفان to Stephen ستفان** Quran Generated Computed Calligraphy (QGCC) as observed from its mirror symmetric alpha&betaSV DF-plots (after omission of the specified segments)

Notice here, in particular the shape of the letter combination "feh" plus "alif" in **"فا"**in this amazingly clear and impressive QGCC of "Stephen" and notice its striking similarity with the same letter combination in the QGCC of **"Fatima"**, as can be seen from Figure 38.

Notice also from Figure 48, that the F-parameter A can also show in its mirror symmetric form, a QGCC of Stephen, but F-plot of A will not show a clear and complete shape letter nun in its Isolate form, as the one that can be seen from Figure 53.

7.4 Quran Generated Computed Calligraphy Observed for the Input Name Edward "ادوارد "

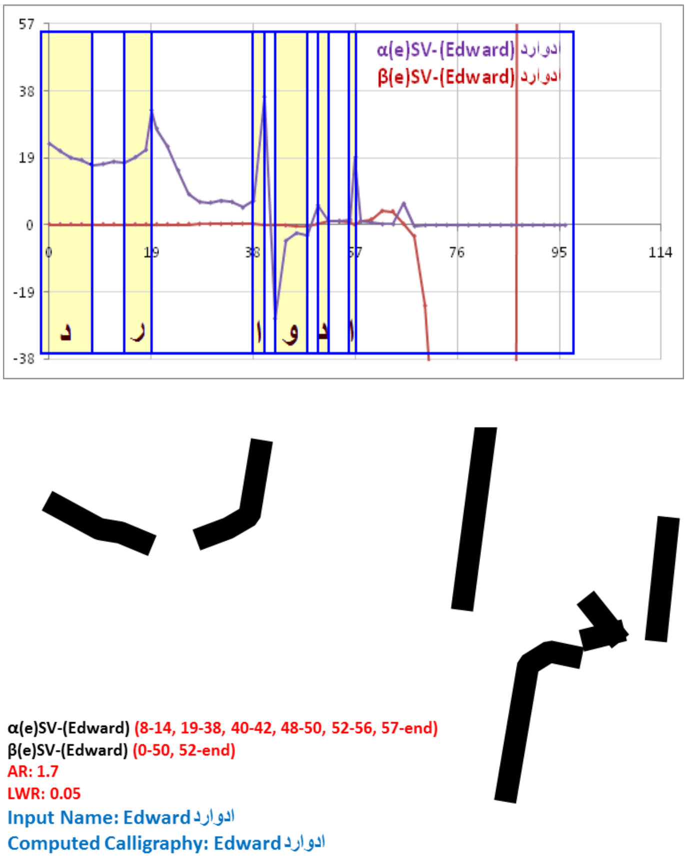


Figure 54. Exact Match, Edward ادوارد to Edward ادوارد Quran Generated Computed Calligraphy (QGCC) as observed from its alpha&betaSV F-plots

Edward is inherently a discrete form word in Arabic i.e., all its letters are written in Isolate form. Observing the top graph in Figure 54, it seems that through using of only alpha (SPW), alternative selections can also be suggested for omitting segments which produce other shape QGCCs of Edward in its Arabic spelling. However, selection of DPW in this case has produced a relatively perfect first letter "dal" **د** in writing **ادوارد** which was only possible by using the F-parameter beta, from J=50 to J=52. Notice that this formation of letter dal takes place only when B=e, is used (base dependence in DPW writing).

8. Quran Generated Computed Calligraphy Observed for the Input Name Baback "*بابک* "

Quran with its exact futuristic vision has also calligraphically marked the name of the individual who will be presenting its NBFS and QGCC mathematical-computational effects. These markings are provided also as extra evidence validating and reemphasizing the particular mathematical-computational construct in sight.

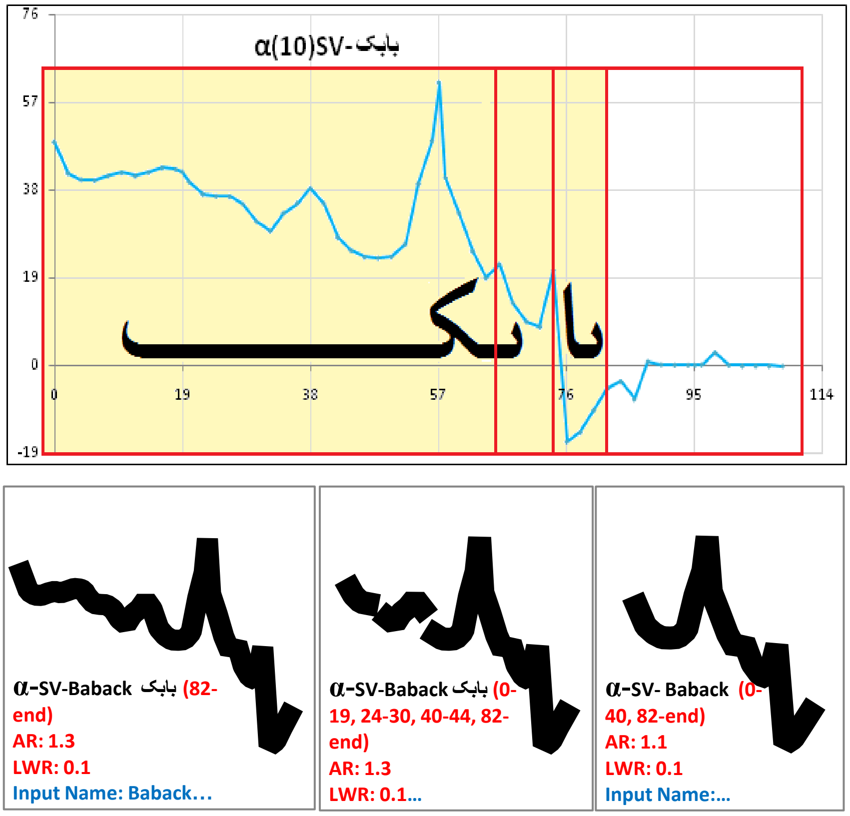


Figure 55. Three "Exact Match" versions, Baback بابک to Baback بابک Quran Generated Computed Calligraphies (QGCCs) as observed from its alphaSV generated F-plots, where each QGCC is made using its specified selection of segments omitted from the continuous form CF-plot on the top

Notice that the CF-plot on the top is exact repeat of alpha(10)SV-CS-author in Figure 106 of the CS-article.

9. The Sensitivity Tests of the QGCCs

We have shown in the CS-article a full range of sensitivity tests for both graphical and NBFS effects observed in Quran. We showed there that slightest systematic changes in quantity of letters, words, and verses in Quran can induce dramatic changes in the relevant observed effects. Obviously, all those sensitivities exist for the QGCCs as well. We will now show in addition to those sensitivity tests presented in the CS-article, the detrimental effects that minimal changes in quantity of letters in Quran can have on the observed QGCCs.

Figure 56 shows the devastating effect of *reduction by only one unit* (-1) and *increase by only one unit* (+1) of the number of names, Ahmad, Christ, and Albert *in only one chapter of Quran*, on the initially observed CF-plots (QGCCs) of these names. The original CF-plots of these names are shown in black and the CF-plots of the manipulated versions are shown in red color. Manipulations are done as in the following:

Number of names Ahmad in chapter (Sura) 102 has been increased from 0 to 1, number of names Christ in chapter (Sura) 101 has been decreased from 2 to 1, and number of names Albert in chapter (Sura) 97 has been decreased from 3 to 2. The original QGCC Figures (of black curves) have also been addressed by indicating their Figure number (e.g. Figure n) in Figure 56.

Notice that in order to change the number of MLF made names in a chapter, we don’t need to change frequencies of all dominant letters for that name but we only have to change the frequency of that particular letter of the alphabet which has the minimum frequency in the respective chapter. Therefore, a ±1 change in frequency of *only one letter in only one chapter* (Sura) can completely vanish the originally observed QGCC!

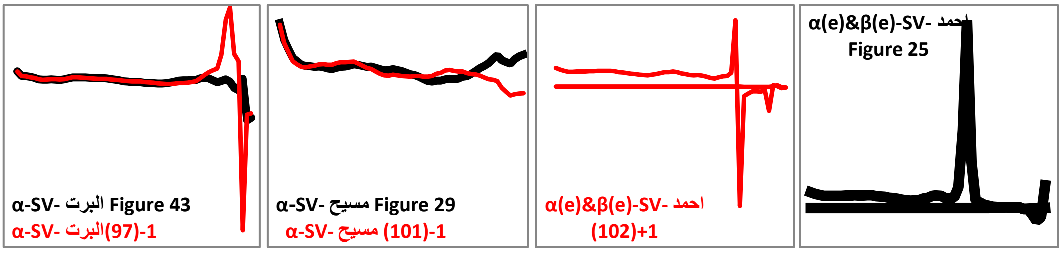


Figure 56. Devastating effect of adding or subtracting only one letter and only in one chapter of Quran, on the CF-plots and thereby on the observed QGCCs of the specified names

10. Letteral Analysis of Quran Generated Computed Calligraphies

It might seem early in this beginning stages of observation of the Computed Calligraphies in Quran for analysis of the symbols that Quran has used in its QGCCs but based on observations made so far, it is possible to present a preliminary analysis of Quran's coded alphabet. Certainly possible future observations of more QGCCs would provide a better picture of alphabetic codes used by Quran. In this section we will try to decode and characterize letters that so far have appeared in the QGCCs observed in this article. In this section, we will also make use of the Arabic Unicode system (Table 4) which identifies Arabic letters in their Isolate, Initial, Medial and Final forms and shapes. In Table 4 we show Arabic Unicode and some calligraphic forms, but only for those letters that have been observed in this article. In this article we drop the term Unicode and show it only with the 4-letter code written in upper case letters. Notice also, that in all observed QGCCs except for Noah that a dot can be seen in the beginning of its QGCC, no dots are observable which is quite expectable because as was explained before, SPW limitations do not permit having two y-values for a single x-value.

1) Letter alif

Observed QGCCs show alif in two forms of Isolate (Unicode) FE8D and Final FE8E. Due to SPW limitations, alif can never be seen exactly vertical as it should be and always seems more or less tilted. In the case of Abraham (Figure 32) and in Alrahman (Figure 34), the second alif has been omitted in their QGCCs which is also a common practice in Arabic writing (the usually omitted dagger alif). Notice also, that in combination of alif with feh in Fatima (Figure 38) and in Stephen (Figure 53), very similar formations of feh+alif are observed in both QGCCs.

2) Letter beh

Quran has used this letter in two similar shape Initial forms in QGCC of author's name (Figure55), and in a shape similar to Nastalique Initial form beh, in QGCC of Abraham (Figure 57R and 57T). Letter beh is also used by Quran in its Medial form FE92 in QGCC of "Nabi" where it follows QGCC of Noah (Figure 33).

3) Letter teh

Quran uses this letter in its Medial form FE98 once vaguely in QGCC of Einstein in Figure 50, and once pronouncedly in QGCC of Stephen in Figure 53.

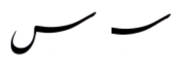
4) Letter ha

This letter has been used 4 times in pronounced shape in Figures 21, 22, and 26, in the QGCCs of Muhammad in Medial form FEA4, and 2 times in pronounced shape in Figures 23 and 27 in QGCCs of Ahmad in Initial form FEA3, where in both names alpha and beta contribute in DPW formation of this letter. In SPW formations of this letter in QGCCs of Noah, Alrahman, Alrahim, Hayy, and Hasan (Figures 33, 34, 35, 37, and 40) due to SPW limitations, Quran consistently uses a hill-top line shape as the Isolate and Initial forms for letter ha.

5) Letter dal

Quran has used letter dal with a shape similar to ـد (dal in Andalus Font) in a Final form FEAA in six QGCCs of Muhammad and Ahmad. Letter dal is also used in QGCC of Mahdi, and in QGCC of the first dal in Edward, where in all these 8 cases both alpha and beta contribute in DPW formation of this letter (Figures 21-23, 26-27, 41, 54). In Edward a SPW formation in the shape of a sloped line has been used by Quran as the second dal. In the case of Edward both dals are in Isolate form FEA9.

Table 4. Arabic letter Unicodes and Calligraphic Forms

English pronunciation	Isolate	Initial	Medial	Final	Calligraphic forms
alif	ا FE8D			ـا FE8E	
beh		بـ FE91	ـبـ FE92		
teh			ـتـ FE98		
ha	ح FEA1	حـ FEA3	ـحـ FEA4		
dal	د FEA9			ـد FEAA	
ra	ر FE8D			ـر FEAE	
sin	س FEB1	سـ FEB3	ـسـ FEB4		 Isolate Medial/Initial **(Nastalique)**
shin			ـشـ FEB8		
ta	ط FEC3	طـ FEC3			
ain	ع FEC9	عـ FEC8			
ghain		غـ FECF			
feh		فـ FED3	ـفـ FED4		
kaf	ك FED9			ـك FEDA --------------- ک FB8F	
lam		لـ FEDF	ـلـ FEE0		
mim	م FEE1	مـ FEE3	ـمـ FEE4	ـم FEE2	
nun	ن FEE5	نـ FEE7	ـنـ FEE8	ـن FEE6	
heh		ھ FBA8	ـھـ FBA9		 Final Medial Initial **(Tholth)**
waw	و FEED			ـو FEEE	
yeh		يـ FEF3	ـيـ FEF4	ى FC90 --------------- ـي FEF2 --------------- ے FBAF	

Unicodes: Arabic Presentation Forms A and B (2015), Calligraphic samples: Khatibi, A. Sijelmassi, M. (1996).

6) Letter ra

This letter has been used by Quran in SPW formations with similar shapes in QGCCs of Maryam, Abraham, Alrahman, Alrahim, and Ghafir (Figures 30, 32, 34, 35, and 39) in the Final form FEAE but in calligraphic shapes (Figures 57, A, B, D, I, O, R, and T). In QGCC of Edward (Figure 54) it is used in Isolate form FE8D.

7) Letter sin

This letter in all its forms is writable through its SPW formation. In Exact match QGCC of Jesus Figure 28, it is observed as a Medial form sin FEB4. In Identical Match QGCC of Jesus in Figure 29, similar to QGCC of Hasan in Figure 40, it has the shape of an extended calligraphic sin (see Table 4 and also Figures 57, B, D and P). In QGCC of Moses, Quran uses sin in its Initial form FEB3 and in QGCC of Stephen it is used in the same Initial form but with a uniquely different shape. In QGCC of Max sin appears in Isolate form FEB1.

8) Letter shin

This letter is used once in QGCC of Einstein where it has the shape of an extended calligraphic sin used in QGCCs of Jesus and Hasan (Figures 29 and 40). In fact, in English sin and not shin is pronounced in Einstein.

9) Letter ta

Quran has used this letter only once in the Exact Match QGCC of Fatima, and it has been shaped in accordance with SPW limitations.

10) Letter ain

Quran has used this letter in its Isolate form FEC9 in Exact Match QGCC of Jesus Figure 28, and in its Initial form FEC8 observable both in Figures 29 in Identical Match QGCC of Jesus, and in Figure 36 in QGCC of Ali. In both latter cases ain is written in accordance with SPW limitations but with two slightly different styles.

11) Letter ghain

This letter has only been used in Gahfir and in an initial form Unicode FECF which due to SPW limitations (like ain), shows a missing lower part in its formation

12) Letter feh

This letter is used both in QGCC of Fatima and QGCC of Stephen in exactly similar forms although in Fatima it is an Initial while in Stephen it is a Medial feh. The shape of feh in these cases resembles a wide angle V upside down. In Ghafir also, Quran has adopted the shape of an upside down V as an Initial form feh.

13) Letter kaf

This letter has been used by Quran in Isolate form (without hamza) FED9 in QGCC of Max (Figure 49), and in the Final form in at least 2 different QGCC versions of author's name, FEDA in case hamza over kaf be considered (Figure 55, middle), and FB8F in its shortest version (Figure 55, far right).

14) Letter lam

This letter has been used twice in the Initial form FEDF in combination with ra, in QGCCs of Alrahman and Alrahim, and has been used in Medial form FEE0 in QGCC of Ali.

15) Letter mim

So far, letter mim seems to be the most frequently observed letter of the Arabic alphabet used by Quran in its QGCCs, that is a total of 19 times. The most common shape of mim in these QGCCs is a small semicircle more like an "O" cut either from its upper or its lower half. In the four QGCCs of Muhammad and two QGCCs of Ahmad, it is in a perfect looking Medial form FEE4. In its Initial form in the four QGCCs of Muhammad, the shapes of mim are different in each case but quite distinguishable (Figures21, 22, and 26). In QGCC of Maryam (Figure 30), Quran uses mim in the Initial position by O with its lower half cut out while in QGCC of Fatima (Figure 38) and in a Medial form, we see mim as an O with its upper half being cut out.

In QGCCs of Maryam, Abraham, and Alrahim (also Alrahman), we observe a Final form mim FEE2. A clear shape Isolate mim Unicode FEE1 can be seen in QGCC of Max (Figure 49). In QGCCs of Moses, mim is observed in Initial position in the shape of an upside down v and in Mahdi looks as Initial form FEE3.

16) Letter nun

Letter nun has been used by Quran two times in its Initial form FEE7 in QGCCs of Noah and Nabi, once in its Medial form FEE8 in QGCC of Einstein, and twice in its usual Final form FEE6 in QGCCs of Hasan and Einstein. This letter has been used once in its calligraphic Final form (Nastalique) in QGCC of Alrahman (Figures 34, 57A, 57B, and 57C). An Isolate form nun FEE5 has also been used by Quran in a DPW formation for writing Stephen in its QGCC (Figure 53).

17) Letter heh

Quran has used heh three times in 3 QGCCs but amazingly in all these cases heh appears in exact accordance with well defined calligraphic and Unicode forms: In QGCC of Abraham heh appears in Initial form FBA8 (see calligraphic forms in Figures 57F, 57R, and 57T), in QGCC of Fatima a well known calligraphic final form "Tholth" variant of heh has been used (Table 4 and Figures 57G, 57K), and in QGCC of Mahdi, heh appears as an exaggerated but otherwise an exact Medial form FBA9.

18) Letter waw

This letter has been used 3 times, two times in the Final form FEEE with very similar shapes in Moses and in Noah (Figures 31, and 33). Letter waw is also used once in Edward in an Isolate form FEED with a slightly different shape from the previous two.

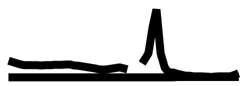
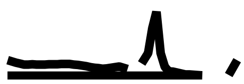
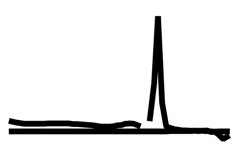
19) Letter yeh

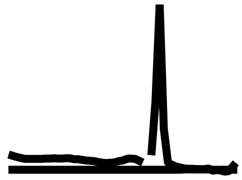
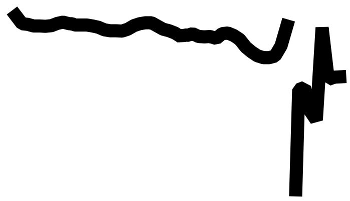
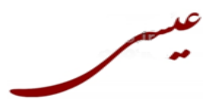
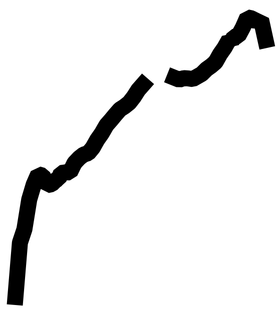
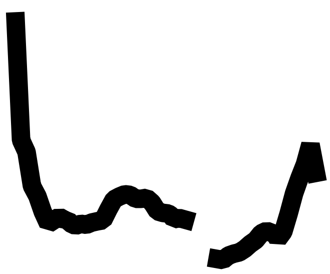
Letter yeh has been used by Quran in various shapes a total of 14 times in the observed QGCCs of this article. This letter has been used in QGCC of Jesus Figure28 both in Initial and in Final Forms FEF3 and FC90. In QGCC of Jesus in Figure 29 it is used in Medial form FEF4 and in a Nastalique calligraphic Final form similar to yeh in Hayy (Figures 57H, 57J, and57S). Letter yeh is also used in Nastalique calligraphic form in QGCC of Maryam (Figure 57O). In QGCC of Moses yeh is used in a Final form FC90 and in QGCC of Abraham yeh can be spotted as Medial form FEF4. In QGCC of Noah in "Nabi", yeh is used in a Final form FBAF which due to SPW limitations its lower part is absent. In QGCC of Alrahim a Medial form yeh is used and in Hayy, a calligraphic Nastalique Final form has been used (Figure 57H). In QGCC of Ali, a SPW adopted Final form Nastalique, or Tholth yeh is used (see Figures 57H, 57L and Table 5). In QGCC of Mahdi a Final form Nastalique yeh has been used (Figure 57S which also shows same shape letter heh in Mahdi's QGCC). In QGCC of Einstein an Initial form yeh FEF3, and a low-key Medial form FEF4 have been used.

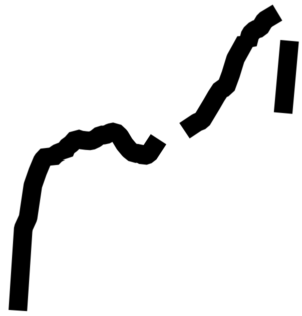
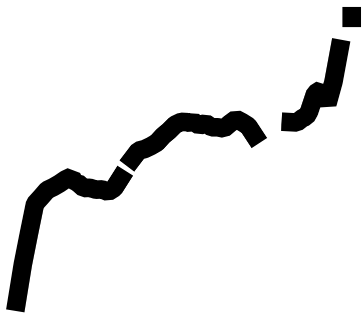
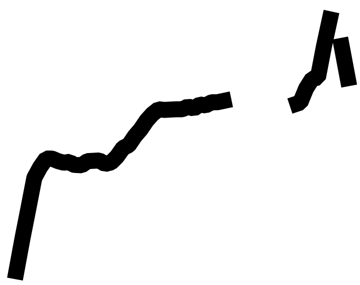
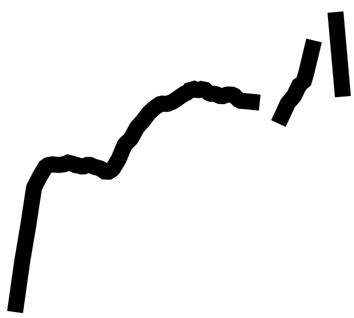
Note that in all Final form cases of yeh, SPW limitations have dictated shapes of yeh in the QGCCs. Another point to note here is the difference that can be observed in these QGCCs between the Final form yeh and the Final form nun. In Final form nun we can observe relatively sharp turning points in the start of the letter nun whereas we do not observe such sharp turning points in the start of letter yeh (compare for instance, QGCCs of Hasan and Einstein). Also notice in particular, the interchangeability of "من"and " م "from Calligraphic examples of "The Opening Statement" shown in Figures 57A , 57B, and 57C.

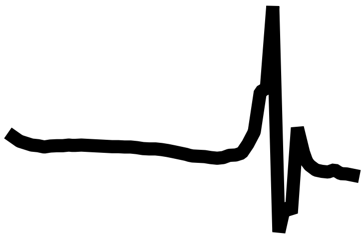
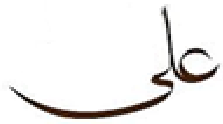
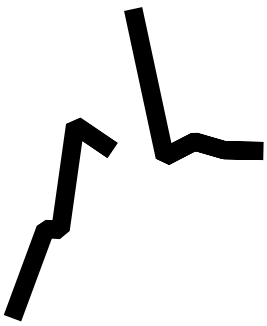
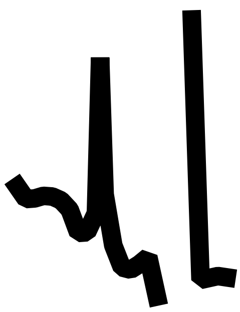
Figure 57. Samples of human written calligraphies (free access calligraphic images from the Web).

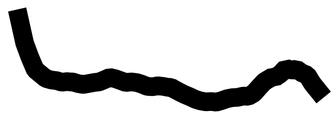
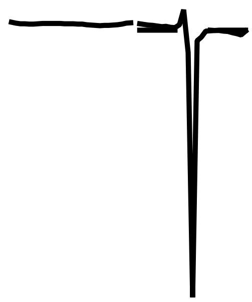
Table 5. QGCC specifications for the Arabic names

Input Name	Match type and F-plot showing the QGCC	Contributing Letters of the Input Name	Output Name Quran Generated Computed Calligraphy (Observed QGCC)	Closest match Human Calligraphy or Printing Font
محمد **Muhammad**	**Exact Muhammad** α&β	ح م د	Figure:21 	Font: Andalus محمد
محمد **Muhammad**	**Exact Muhammad** α&β	ح م د	Figure:22 	
محمد **Muhammad**	**Identical Ahmad** α&β	ح م د	Figure:23 	
احمد **Ahmad**	**Exact Ahmad** α&β	ح د	Figure:27 	Font: Andalus احمد
احمد **Ahmad**	**Identical Muhammad** α&β	ح د	Figure:26 	

احمد **Ahmad**	**Identical** **Muhammad** **α&β**	ح د	Figure:26 	
عيسى **Jesus**	**Exact** **Jesus** **α**	س ع ى	Figure:28 	Tholth 
مسيح **Messiah** **(Christ)**	**Identical** **Jesus** **α**	ح س ى	Figure:29 	Nastalique 
مريم **Maryam** **(Mary)**	**Exact** **Maryam** **β**	م ر ى	Figure:30 	Nastalique 
موسى **Moses**	**Exact** **Moses** **α**	س و ى	Figure:31 	Nastalique 

ابراهيم **Abraham**	**Exact** **Abramam** **β**	ب ر ه ی م	Figure:32 	Nastalique 
نوح **Noah**	**Exact** **Noah Prophet** **β**	ح ن و	Figure:33 	**Nastalique** 
الرحمن **Alrahman**	**Exact and Identical** **Alrahman** **β**	ر ح م ن	Figure:34 	**Nastalique** 
الرحيم **Alrahim**	**Exact and Identical** **Alrahim** **β**	ر ح ی م	Figure:35 	**Nastalique** 

حى **Hayy**	**Exact** **Hayy** α	ح ى	Figure:37 	**Nastalique** 
على **Ali**	**Exact** **Ali** α	ع ى	Figure:36 	**Nastalique**   **Tholth**
غافر **Ghafir**	**Exact** **Ghafir** α	غ ف	Figure:39 	Nastalique 
فاطمه **Fatima**	**Exact** **Fatima** α	ط ف	Figure:38 	Tholth  

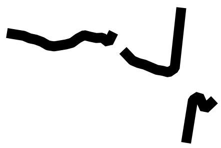
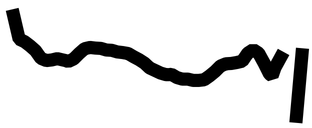
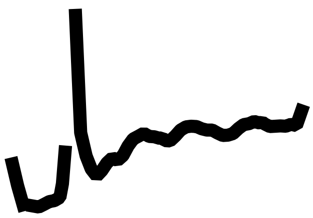
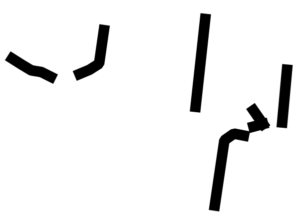
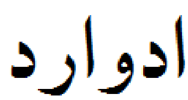
حسن **Hasan**	**Exact** **Hasan** **α**	ح س ن	Figure:40 	Nastalique 
مهدی **Mahdi**	**Exact** **Mahdi** **α&β**	د ه ی	Figure:41 	Nastalique 

The first column on the left shows the Input Name, the second column shows the type of Match (Exact Match or Identical Match) Output Name and the F-parameter(s) through which the QGCC is observed. The third column shows those letters of the Input Name that contribute in MLF making of its variations. In the third column, red colored letter is the letter with most contribution in the MLF making of the NV for the specified name.

The fourth column shows the actual observed calligraphy (QGCC) with the Figure number where its larger size calligraphy can be observed in this article. Notice that in these miniature calligraphies the aspect ratios and line width ratios have changed compared to the large size QGCCs shown in their relevant Figures. In the fifth column, the closest form human made calligraphy that could be found on the web in known Islamic forms of calligraphy, Naskh, Tholth, and Nastalique have been shown. In this last column, occasionally some common Arabic fonts that can better resemble the respective QGCC have been used. Notice also, that in order to be able to have a better comparison, in many cases dots of all constituent letters have been omitted from sample calligraphies shown in the fifth column.

Table 6. QGCC specifications for the physicists' first names

Input Name	Match type and **F-plot** showing the QGCC	Contributing Letters of the Input Name	Output Name Quran Generated Computed Calligraphy (Observed QGCC)	Closest match Human Calligraphy or Printing Font

مکس Max	Exact Max α	س ک	Figure 49 	Naskh 
البرت Albert	Identical Einstein α	ب ر ت	Figure 50 	Nastalique 
ستفان Stephen	Exact Stephen α&β	س ت ف ن	Figure 53 	Font: O Arial Unicode MS 
ادوارد Edward	Exact Edward α&β	د ر	Figure 54 	Font: B. Badr 

Explanations for the Table 6 are the same as those for Table 5.

Table 7. QGCC specifications for the Persian name of the author-investigator

Input Name	Match type and **F-plot** showing the QGCC	Contributing Letters of the Input Name	Output Name Quran Generated Computed Calligraphy (Observed QGCC)	Closest match Human Calligraphy or Printing Font
بابک Baback	Exact Baback α	ک ب	Figure 55 	Naskh   Tholth

In Table 7 three different versions of the Exact Match QGCCs of author's name which are only different in their omitted segments used for writing the last letter kaf " ک ", are presented (see Figure 55). Unicode forms of kaf in Table 4 can also be compared with different shapes of kaf in these three versions. Explanations for Table 7 are the same as those for Table 5.

11. Summary and Discussion of the Observed Effects

This article started with presentation of the NBFS couplings and effects observed for the Sorted Variations in Quran of the MLF made Natural Variations of some Arabic names. As we stated in the introduction, this work was mainly motivated by the observations made in our fundamental CS-article which showed very interesting NBFS couplings and effects for certain names. During the SF-analyses of these names however, some striking observations completely changed the course of study. Existence of a most phenomenal Computed Calligraphy in Quran (QGCC) was noted as an amazing effect never encountered before. It was observed that precise intelligent control of letter frequencies in chapters of Quran not only manifests itself through NBFS couplings and effects observed for characters and names in their F-plots, but also through calligraphic printing of names observable in the same F-plots. It should be mentioned that in this article too, there were many other names that were SF-analyzed but did not show any QGCC, or even any notable NBFS effects and therefore we do not mention them in this article.

The fact that these QGCCs are observed through the same systematic SF-analysis that has revealed the NBFS numerical construct of Quran indicates existence of a unified multifaceted mathematical design behind both numerical and calligraphic effects. Not just one or two, but more than 20 clear, letter by letter calligraphies of some distinguished names have repeatedly been generated and detected through the SF-analysis which by no means can be attributed to accident.

The question of why Quran has chosen this peculiar analysis, the SF-analysis, for decoding at least some of its mathematical-computational properties was also discussed in the CS-article with no clear answer. However, these calligraphic observations reemphasize role of the SF-analysis as a unique key through which many facets of the mathematical-computational quantitative design of Quran can be detected and observed. Obviously, MFCW design of Quran and its consequences as discussed in the CS-article are being strongly reinforced by these new observations.

11.1 QGCC Effects and Their Extremely High Sensitivities to Manipulations in Quran

Concerning the NBFS effects observable for the MLF made names in this article we only refer the reader to Table1and Table 2 and the F-plots of these names that follow these Tables. As for the calligraphic effects, we can see that the names Muhammad and Ahmad with six different styles in both bases B=e and 10, have the highest number and also the most impressive QGCCs. There are 3 Exact Match and 3 Identical Match QGCCs of these names formed by alph&beta (DPW) F-plots. The most dominant letter in formation of Muhammad and Ahmad QGCCs is letter ha ح (specified by red color in Table 5).

QGCCs of Jesus and Christ with one Exact Match and one Identical Match are the next most frequently observable QGCCs (corresponding to the same person) and they both are observed through their alphaSV (SPW) F-plots.

It is interesting to note that all observed QGCCs are formed either by alpha or beta or the combination of these two F-parameters. Muhammad, Ahmad, Mahdi in Arabic names, and Stephen, and Edward in non-Arabic names show their QGCCs through alpha&beta F-plots. Al-rahman, Al-rahim, Maryam, Abraham, and Noah show their QGCCs through beta F-plots and the rest of names manifest their QGCCs through alpha F-plots. However, in the cases of Moses and Hasan, K and A also can generate the Exact Match QGCCs of these names (see K and A, F-plots in Figures 15, and 18).

The most frequently used letters in formation of the QGCCs (formation of the MLF made NVs) are letter ha with 12, letter yeh with 9, and letter dal with 8 cases. The least frequently used letters are ghain and ta each having been used only once in our observed QGCCs.

Sensitivity tests like the ones presented in the CS-article show absolutely devastating effects of the slightest manipulations in letter frequencies of chapters in Quran on both NBSF and QGCC effects simultaneously. As additionally performed such tests of sensitivity we have presented in Figure 56, the totally destructive effect of changing the number of letters, in only one chapter of Quran and only by one letter of alphabet, on the observed F-plots and thereby QGCCs (and NBFS) effects.

As it was seen in the CS-article, here too, the crucial role of small size chapters in producing graphical and numerical effects in Quran is reemphasized again. It so seems that frequencies of letters in smaller chapters of Quran play in fact the role of extremely delicate control buttons that determine with astonishing precision all mathematical-computational effects in this incredible scripture.

It is also interesting to note that each and every one of these QGCCs seems to have its own calligraphic character and style, distinguishing it from other QGCCs, particularly those belonging to different names.

11.2 Targeting and Timing of Quran

In fact, QGCC calligraphic effects present and reinforce the same mathematical message that is conveyed by the numerical observations of the NBFS, but this time not with numbers. QGCC sets up through exhibition of computed calligraphies, an amazing gallery of visual arts. This makes QGCC a lot more fascinating not only to a limited group who can understand its mathematical-computational underlying but also to a much larger target audience who can appreciate its visual attractions. Needles to say, this is also a part of mathematical scenario of Quran designed way back in time to deliver designated messages at predetermined times to the future scientifically advanced generations of humans.

The fact that calligraphic effects are best observable through using certain plot options of certain popular software (see Appendix D) is also another sign of a most precise futuristic vision of Quran. Clearly Quran has designed its visual calligraphic effects not only based on certain mathematical concepts but also based on exact software and hardware capabilities of the computing machines at the time of the discovery of these effects. In these amazing Quran Computed Calligraphies, we are in a sense observing "handwriting" of the Author of Quran generated of course by the computer hardware and software. The Author of Quran, with His exact timeless and boundless "knowledge of everything" Has already determined when and using which hardware and software Quran's mathematical messages would be observed in the manner they should.

Notice that we did not try to develop a computer program for the SF-analyses presented in this article for two reasons: Firstly because Minitab 16 which was also used in the CS-article, is a well tested professional statistical software which makes miscalculations least probable and secondly, because we intended the program that we use to be easily accessible by the readers so that they can independently repeat and check computations and results presented in this article. Microsoft Excel which we have mainly used for its plot options is also a well known popular and accessible program that can easily be used by the readers.

11.3 Speculations about the Observed Computed Calligraphies of the Physicists

In the CS-article we noted that F-plots of the names of some scientists and individuals not only show certain NBFS coupling and effects but they seem also to have some personal information coded in them. This personal information appears to be both numerical and as we will see, also graphical. F-plots of names show some specific numbers that are closely related to important events in the lives of the owners of these names. It was mentioned for instance, that terminal J value in the F-plots of Fourier is J=62, which coincides with his age at the time of his death. For Newton, we also observed in his beta F-plot, a minimum at J=84, which also coincides with his terminal age. In some cases other important events of individual's lifetime can also be seen as marked in their name's F-plots.

It was stated in the CS-article that the numerical signs, such as those mentioned in the above paragraph are perhaps identification signs which serve to more accurately correlate the F-plot with the specific person represented by that F-plot. We will now present some observations about the QGCCs of the physicists in this article. The reader must keep in mind though, that these are just personal speculations of the author.

At the end of the 19th century physics was shaken by two ground breaking theories, Quantum and Relativity. In 1900 Max Planck introduced the first, and in 1905 Albert Einstein introduced the second.

11.3.1 Max Planck and Quantization

Observe in QGCC of Max, that we see in contrast to all other QGCCs, separation or "discreteness" such that three letters mim, kaf, and sin are *all in Isolate forms* and separated with blank spaces between them. This in our opinion can be a symbolic reference of Quran to discontinuity or Quantization (as opposed to continuity) which was first proposed by the theoretical physicist Max Planck.

Notice here also an interesting numerical observation that the last J value in Max QGCC, which coincides with the start of Arabic letter mim in his name, corresponds to J=89 and Max Planck aged 89.

11.3.2 Albert Einstein and Relativity

In QGCC of Albert, we see a *transformation from the first name to the last name* for the same individual. This in our opinion is a symbolic reference of Quran to Relativity of observation. In other words, it symbolizes how observation of the same thing (same individual in this case) can yield different results from different frames of observation (for instance observed from frame of the F-plots). The theory of Relativity of course was first introduced by the theoretical physicist Albert Einstein.

It is true that we have seen before Identical Match QGCCs where two different Input and Output Names belonged to the same individual but they were not the first and last names also, in the physicists it is only Einstein that shows this sort of coupling in his QGCC.

11.3.3 Stephen Hawking, Edward Witten and Supersymmetry

If through QGCC of the name of a physicist Quran is pointing at a verified physical theory associated with that physicist, then what can be interpretation of QGCCs observed for Stephen and Edward? In recent years, among the biggest questions on the minds of theoretical physicists has been the validity of a so called M-theory. Proposed by Witten and apparently supported by many physicists including Hawking, M-theory makes use of a *not as yet observed, Supersymmetry* (see for instance, Mirror symmetry, String theory, and Superstring theory).

Can then, Quran QGCC of Stephen which is only observable through its *mirror symmetric* CF-plot be in fact a signal from Quran on behalf of the Supersymmetry? Can the *"string-like"* shape of the Initial form letter "sin" in QGCC of **ستفان** which is distinctly different from observed shape of this letter in other QGCCs be a graphical sign of approval by Quran on behalf of the String theory?

If these interpretations be true then we should be expecting to see sooner or later, experimental evidence in support of the Supersymmetry and the M-theory.

As to why Hawking's name has been selected by Quran to transmit this message, besides his well recognized scientific status, this might be a show of respect for human resilience and strive in attaining knowledge in spite of severe disabilities for which Stephen Hawking is a symbol.

Edward's lettering in Arabic is inherently discrete and non-continuous (ادوارد), so quantization is already associated with this name but there seem to be other features in Edward's CF-plots that as yet are not easily interpretable so we skip. Interesting numerical features can also be noted from both Edward's and Stephen's F-plots (Figures 47 and 48).

12. Concluding Remarks

It appears that the discovery of mathematical-computational construct of Quran with all its implied messages has been synchronized with the beginning years of the 21st century. A number of these important messages of Quran have already been explained in the CS-article. It is absolutely astonishing to note that such mathematical-computational effects are being observed in a book which since its appearance has also set the standard for perfection in the Arabic literature! MFCW concepts introduced in the CS-article definitely are strongly reinforced by these new calligraphic observations. It so seems that the SF-analysis is the key to decode at least an important class of mathematically coded messages in Quran. In particular, there are a great number of other names that can be examined through SF-analysis of their MLF made variations for study of their NBFS and QGCC effects in Quran. There can of course be other methods and procedures waiting to be discovered for disclosing other possible mathematical structures and features in Quran.

We recommend our readers to repeat and check computations and observations presented in this article and even extend the range of analyses to include more names and examples. Appropriate software should also be developed to facilitate and speed up the work but Minitab or IBM-SPSS should suffice for the start. Obviously, a thorough and more complete examination of the NBFS and QGCC effects will require many more observations to be made. In the Appendices A to D in this article we have provided all necessary data and have shown sample computations that might be needed to check SF-analysis methods and results.

At the end, it so seems that after a very long period of no "scriptural communication" with humans, the Author of Quran is relaying to us certain mathematical messages which have been possible to detect only through scientific and technological capabilities of our times. This in itself is a most remarkable event which we think will have profound scientific, theological and philosophical implications.

Acknowledgements

The research presented in article is not supported by or affiliated with any governmental or private organization and is product of an independent research by the author alone. In this article as in the CS-article, we have only intended to show glimpses of the colossal mathematical-computational quantitative construct of Quran and its important implications. In particular, this article does not intend to advocate any religion or sect of a religion and presents only certain computationally verifiable facts about Quran just the way they are.

I sincerely thank God for His guidance and support throughout this mathematical venture of mine in Quran.

References

Arabic alphabet (2015). Retrieved from http://web.stanford.edu/dept/lc/arabic/alphabet/

Arabic Presentation Forms-A (2015). Retrieved from http://Unicode.org/charts/PDF/UFB50.pdf

Arabic Presentation Forms-B (2015). Retrieved from http://Unicode.org/charts/PDF/UFE70.pdf

Calligraphy. (2015). Retrieved from https://en.wikipedia.org/wiki/calligraphy

CS-article: The same as, Khodadoost, B. (2015).

Khatibi, A., & Sijelmassi, M. (1996). The Splendor of Islamic Calligraphy. In Thames & Hudson (Eds.), 1996, London. (Jayez M. & Abdolali M. Trans., 2014, Mirdashti Pub, Tehran, Iran)

Khodadoost, B. (2015). The Computed Scripture: Exponentially Based Fourier Regulated Construct of Quran and its Fundamentally Important Consequences, J. *Computer and Information Science, 8*(3), 2015-195. http://dx.doi.org/10.5539/cis.v8n3p195

Madi, M. (2010). *A study of Arabic letter frequency analysis.* Retrieved from http://www.intellaren.com/

articles/en/a-study-of-arabic-letter-frequency-analysis

Madi, M. (2010). *Quran Suras statistics.* Retrieved from http://www.intellaren.com/articles/en/qss

Mirror symmetry (string theory). (2010). Retrieved from http://en.wikipedia.org/wiki/Mirror_symmetry_(string_theory)

Quran.com Retrieved from: http://quran.com/.

String theory. (2010). Retrieved from http://en.wikipedia.org/wiki/String_theory

Superstring theory. (2010). Retrieved from http://en.wikipedia.org/wiki/Superstring_theory

Appendix A

Table A1. Statistics of letter frequencies in chapters of Quran, Madi, M. (2010)

Chapter	ا	ب	ت	ث	ج	ح	خ	د	ذ	ر	ز	س	ش	ص
1	26	4	3	0	0	5	0	4	1	8	0	3	0	2
2	4844	919	1186	128	200	330	191	458	330	876	107	452	168	155
3	2730	575	657	52	93	173	104	252	218	510	67	228	86	88
4	3082	479	677	75	136	198	128	301	181	491	51	307	82	122
5	2365	395	479	59	93	173	85	231	182	381	57	215	63	74
6	2244	454	474	58	117	162	75	199	207	506	66	213	132	69
7	2730	509	571	61	165	166	129	246	229	534	41	300	83	97
8	920	174	192	18	38	54	34	87	95	187	23	71	27	29
9	1926	350	394	31	102	138	86	207	145	412	55	194	49	63
10	1399	239	296	30	83	100	40	126	115	257	26	130	42	32
11	1473	284	291	32	79	88	57	146	96	325	35	123	43	60
12	1419	270	266	29	80	103	71	141	81	257	34	167	42	61
13	657	152	120	16	35	44	23	77	47	137	21	71	22	20
14	640	135	132	17	34	35	31	73	53	160	21	77	25	24
15	542	101	91	4	43	44	24	41	22	96	19	67	16	23
16	1338	270	306	45	71	91	72	123	122	289	45	139	64	33
17	1280	259	253	27	85	90	61	143	87	301	38	148	42	31
18	1233	272	275	41	89	107	49	170	106	277	33	124	47	45
19	757	155	169	19	42	65	31	98	54	169	19	66	35	26
20	988	180	220	23	63	77	59	103	65	212	30	120	32	35
21	958	162	192	13	54	77	34	97	76	190	17	100	29	32
22	925	179	177	27	55	59	40	96	89	204	26	95	34	43
23	809	167	181	31	39	63	49	60	72	183	17	67	29	20
24	998	209	252	20	58	85	47	88	85	176	33	90	44	33
25	774	137	132	20	54	46	33	64	87	194	21	82	27	18
26	1007	190	195	29	60	61	38	51	85	218	40	94	24	25
27	885	153	215	12	55	54	35	98	56	194	19	94	37	26
28	1090	170	256	16	72	73	38	124	52	218	19	102	33	39
29	838	149	153	18	47	52	30	64	67	118	21	71	21	25
30	582	111	136	27	25	45	25	51	59	142	15	71	26	16
31	392	76	82	9	19	32	21	46	20	91	14	38	18	20
32	288	51	56	6	23	13	12	25	29	66	8	32	7	8
33	1146	163	215	14	62	68	39	105	81	195	32	92	28	30
34	658	142	108	14	39	38	14	76	67	153	30	60	28	12
35	604	104	109	13	38	43	29	63	58	159	30	67	24	20
36	552	72	106	14	36	42	28	50	45	123	18	48	27	22
37	722	156	123	12	45	58	24	59	57	129	23	73	19	34
38	625	148	89	9	36	54	37	69	62	127	20	54	20	29
39	849	178	194	29	49	63	50	88	88	172	34	95	34	22

40	940	212	167	23	41	64	33	115	91	211	23	100	27	33
41	651	96	127	12	29	48	25	68	56	118	23	65	30	19
42	628	130	106	13	32	53	15	64	57	141	22	54	38	28
43	633	141	143	14	44	44	32	63	55	133	11	72	21	17
44	268	62	53	5	15	16	7	15	19	63	10	23	9	4
45	390	70	109	10	19	31	16	21	30	63	16	40	7	9
46	505	95	100	7	25	36	16	57	48	98	13	48	13	20
47	451	73	98	12	13	25	16	35	43	95	9	36	10	16
48	413	71	101	9	30	33	17	59	33	98	18	53	17	13
49	307	53	59	6	11	22	12	17	10	46	3	30	5	13
50	241	77	48	1	23	28	16	58	23	54	7	28	13	12
51	269	37	61	4	21	19	14	18	33	67	5	37	4	9
52	211	64	47	5	10	19	5	17	20	60	4	27	9	13
53	296	44	61	10	12	18	7	28	23	47	16	30	14	3
54	242	59	52	2	19	23	7	47	42	108	11	33	14	13
55	403	125	66	3	27	15	15	7	45	87	7	30	9	7
56	323	62	82	15	20	43	10	18	16	64	13	23	21	17
57	455	89	99	13	26	29	16	37	30	120	12	47	12	12
58	379	63	71	10	24	31	12	36	36	53	13	39	18	12
59	377	65	57	6	23	25	21	31	29	79	10	35	17	19
60	294	51	69	2	19	22	9	30	17	52	5	24	4	6
61	168	31	34	0	7	15	3	19	15	43	5	22	3	9
62	148	18	35	7	3	12	4	12	16	24	7	9	3	3
63	137	15	26	1	9	8	8	12	13	28	4	22	3	5
64	194	39	39	3	6	18	7	15	16	42	6	20	6	11
65	212	35	56	6	15	25	10	32	15	52	6	28	9	3
66	213	44	56	4	14	18	8	19	11	50	5	11	3	8
67	236	49	40	1	16	17	9	17	32	72	10	28	13	16
68	211	56	46	6	13	21	9	28	19	50	4	26	5	15
69	202	37	68	7	9	22	14	12	17	40	3	22	6	8
70	157	31	25	2	15	12	10	19	23	39	4	15	7	11
71	205	28	34	6	19	5	10	25	10	62	4	21	2	4
72	238	37	19	1	17	18	5	54	7	50	3	27	12	8
73	168	23	33	6	10	7	8	11	12	49	3	18	6	8
74	186	33	49	10	8	12	6	26	25	70	3	23	14	8
75	124	30	27	5	10	7	4	6	15	34	2	26	1	4
76	225	36	35	6	14	14	8	18	15	67	9	32	17	4
77	137	23	28	4	12	5	3	9	36	34	1	9	7	7
78	206	40	28	3	19	14	6	11	12	28	6	17	5	7
79	188	27	39	4	11	14	12	16	14	43	4	20	10	2
80	103	20	34	4	6	7	6	5	9	32	3	11	9	6
81	95	16	23	1	9	10	1	4	19	20	2	17	11	3
82	71	15	13	3	3	5	2	8	7	21	0	7	2	2
83	138	29	20	5	8	8	3	5	20	32	3	15	2	1
84	93	25	16	1	2	10	1	5	10	26	0	15	3	3
85	81	15	14	3	7	11	1	22	12	17	3	3	8	2
86	57	7	5	1	4	3	3	9	2	17	1	6	0	4
87	52	9	8	3	4	9	6	4	9	21	1	11	3	4
88	66	14	27	4	6	6	2	1	6	19	1	11	2	5
89	117	26	23	6	9	9	4	19	18	33	1	9	2	5
90	71	21	19	1	2	11	1	14	7	12	0	8	2	6
91	67	11	4	2	2	5	2	6	7	9	1	9	3	0
92	60	9	15	1	4	5	3	5	9	14	2	13	3	2
93	31	5	7	1	4	4	2	6	1	10	0	4	0	0
94	19	4	1	0	0	3	0	1	3	15	1	5	1	2
95	34	6	4	1	1	6	1	6	3	6	1	7	0	1

96	65	14	14	0	2	2	3	6	6	16	1	9	0	3
97	23	3	6	0	1	4	1	4	1	12	2	2	1	0
98	77	14	26	0	5	7	5	9	6	21	2	2	4	4
99	39	4	7	4	1	4	3	2	5	15	4	3	2	1
100	32	12	3	2	1	7	2	7	3	12	0	3	2	3
101	38	3	10	3	1	3	1	2	0	10	2	2	3	0
102	18	2	9	4	1	4	0	0	1	7	1	4	0	0
103	23	4	3	0	0	4	1	0	1	5	0	3	0	5
104	24	3	10	0	1	5	1	10	2	4	2	2	0	1
105	14	7	4	0	4	4	0	1	0	8	0	3	0	2
106	17	4	3	0	1	3	1	1	2	5	0	1	2	1
107	20	3	3	0	0	3	0	2	6	4	0	3	0	2
108	13	3	1	1	0	3	0	0	0	6	0	1	1	1
109	26	9	4	0	0	2	0	10	0	3	0	1	0	0
110	21	5	4	0	2	5	1	3	1	6	0	4	0	1
111	17	9	6	0	1	5	0	3	1	4	0	4	0	1
112	9	1	0	0	0	4	0	5	0	2	0	1	0	1
113	16	4	1	1	0	4	1	3	3	7	0	4	4	0
114	21	3	1	0	1	2	1	1	2	5	0	11	1	1

Table A1. (continued)

Chapter	ض	ط	ظ	ع	غ	ف	ق	ك	ل	م	ن	ه	و	ى
1	2	2	0	6	2	0	1	3	22	15	11	5	4	14
2	133	99	62	797	75	751	553	832	3205	2195	2020	1198	2105	1899
3	66	50	36	383	62	396	306	485	1896	1249	1233	665	1186	1158
4	101	65	45	404	62	503	255	582	1966	1306	1335	768	1352	1297
5	53	52	18	338	47	291	265	384	1464	1042	975	531	941	972
6	66	52	48	369	50	294	271	468	1452	1061	1011	610	1017	1000
7	62	56	43	400	67	357	356	466	1531	1164	1304	629	1123	1035
8	27	22	8	162	25	153	109	200	657	458	438	259	488	451
9	61	34	29	313	37	308	216	301	1347	964	878	652	1010	813
10	43	17	32	211	20	216	181	260	916	654	690	310	542	601
11	32	28	24	244	34	186	180	256	797	702	634	329	609	649
12	32	19	14	218	28	198	193	219	813	491	633	348	490	609
13	24	12	6	99	15	81	87	104	482	260	230	175	273	274
14	22	11	11	95	13	83	57	113	453	306	278	141	250	268
15	14	11	9	80	8	64	83	85	324	257	320	97	200	216
16	32	25	22	230	23	193	131	263	990	688	644	378	628	596
17	44	29	16	187	21	168	155	258	752	444	531	228	497	487
18	31	39	17	206	36	174	151	173	663	493	509	315	414	482
19	17	13	5	117	16	75	86	137	389	290	341	149	264	350
20	35	28	5	172	17	184	162	180	588	379	399	215	346	501
21	26	17	17	150	14	145	105	156	545	400	512	264	395	336
22	27	30	13	164	14	142	98	154	693	424	389	279	383	474
23	20	17	13	129	18	135	109	130	472	386	428	213	351	294
24	38	24	17	179	27	132	61	180	723	483	435	300	465	491
25	23	11	9	109	9	73	89	125	450	246	283	140	337	304
26	20	33	17	204	18	142	133	186	613	484	603	171	439	469
27	24	27	16	134	11	116	120	140	533	399	423	228	342	363
28	29	19	16	177	25	150	147	178	668	460	565	275	421	517
29	16	17	8	114	9	101	92	127	554	344	408	196	357	319
30	30	9	11	93	8	110	77	120	395	317	276	148	274	292
31	13	6	7	63	14	53	31	69	299	173	154	107	148	175
32	8	2	4	45	1	46	38	46	155	158	159	66	122	108
33	24	24	17	151	18	122	111	197	715	421	507	276	489	465

34	25	10	8	114	14	98	94	115	420	290	289	126	271	300
35	20	8	8	78	18	93	42	108	401	253	235	156	220	256
36	15	14	5	83	12	70	72	77	332	312	302	141	224	245
37	14	21	16	111	12	112	80	98	448	319	434	165	273	281
38	17	20	7	98	15	76	74	88	333	209	258	121	201	188
39	32	11	10	125	13	122	115	143	630	381	370	256	339	396
40	26	12	11	142	19	149	107	187	628	380	404	204	368	410
41	16	8	10	102	10	92	81	86	361	276	296	144	249	286
42	23	10	14	98	14	84	57	93	428	300	257	170	272	340
43	24	10	11	121	3	94	84	112	374	324	330	178	283	257
44	4	5	2	47	5	32	35	50	140	150	155	60	116	123
45	13	3	6	60	7	43	36	68	246	200	151	97	157	186
46	18	4	4	79	10	64	73	77	292	225	216	119	206	218
47	18	16	4	73	11	73	38	75	303	226	177	141	197	158
48	9	9	12	82	15	63	47	83	323	205	188	129	202	197
49	9	6	4	43	8	34	32	49	197	135	124	65	131	121
50	6	6	5	45	7	42	57	43	171	118	113	55	109	120
51	4	7	2	39	6	62	46	39	163	147	144	64	130	114
52	4	7	1	38	8	34	28	41	119	150	118	69	119	96
53	9	7	4	34	14	37	17	33	151	112	114	62	118	131
54	6	8	1	53	5	50	48	57	123	111	122	51	98	83
55	7	10	1	18	4	68	22	84	142	112	143	40	68	101
56	7	7	9	44	4	40	35	49	177	178	202	37	152	107
57	25	5	8	61	12	72	49	74	319	218	178	121	225	200
58	5	8	3	54	5	45	27	48	260	172	163	124	185	169
59	5	4	4	38	6	49	44	44	274	151	156	116	162	142
60	4	3	2	33	9	41	27	66	174	143	135	73	139	126
61	1	4	5	18	3	25	19	26	126	78	79	51	81	95
62	8	0	3	16	2	18	14	24	114	74	49	36	61	67
63	2	1	0	20	4	25	23	24	118	66	70	49	72	55
64	6	4	2	33	8	36	14	35	147	93	68	51	110	81
65	9	3	4	44	2	27	28	28	158	79	95	80	75	86
66	8	2	6	33	7	24	17	32	118	87	99	57	77	93
67	6	6	1	36	6	45	36	47	146	112	99	56	94	120
68	4	11	3	42	8	28	21	53	133	123	132	49	96	96
69	6	9	3	38	5	38	29	34	117	92	74	54	83	103
70	3	2	3	38	4	23	16	20	100	101	81	52	84	93
71	6	5	2	25	8	18	21	32	110	80	61	35	88	58
72	6	8	5	37	5	25	25	19	119	74	115	58	72	64
73	7	5	1	20	5	25	24	24	111	55	59	38	69	68
74	5	3	1	22	2	33	25	44	109	74	79	37	66	81
75	1	2	4	16	1	19	27	16	84	43	54	22	43	68
76	5	12	2	26	1	26	15	37	96	77	87	53	79	90
77	1	4	3	22	1	29	18	37	108	77	68	18	73	86
78	2	3	2	19	3	23	17	26	75	55	62	19	61	46
79	3	7	1	19	4	29	11	23	70	51	47	39	41	55
80	4	3	1	13	4	22	13	21	39	46	34	36	32	48
81	2	4	0	12	1	8	8	9	50	30	31	8	37	23
82	0	1	1	8	2	13	3	18	35	30	24	6	22	30
83	4	2	5	18	1	19	13	32	80	66	71	27	69	73
84	1	2	2	8	1	13	15	11	44	30	32	24	37	34
85	1	2	1	14	1	11	6	8	61	41	29	25	53	36
86	1	2	2	5	0	8	9	7	37	22	17	12	15	17
87	0	0	0	5	1	13	6	9	38	15	14	11	17	42
88	4	3	1	18	3	16	3	10	39	29	24	14	23	44
89	4	4	0	16	1	23	10	22	71	35	24	18	39	55

90	0	1	0	7	1	6	10	8	38	30	25	11	24	25
91	2	2	0	4	2	10	10	3	25	19	9	28	24	6
92	1	1	1	8	4	5	5	6	44	16	23	13	21	40
93	3	1	0	4	1	9	2	9	23	13	5	4	15	20
94	2	0	1	7	2	6	1	9	11	6	9	2	5	5
95	0	1	0	2	1	5	3	4	25	14	18	5	11	15
96	0	3	0	12	2	2	8	10	42	16	25	8	7	31
97	0	1	0	1	0	4	3	3	23	12	8	6	3	10
98	2	1	0	7	0	10	4	15	49	32	35	23	26	37
99	2	0	0	3	0	1	4	1	22	14	7	9	7	13
100	1	1	0	6	1	7	3	2	22	12	11	9	10	14
101	1	0	0	5	0	7	4	6	15	19	11	9	13	11
102	0	0	0	7	0	2	3	5	23	16	12	3	9	11
103	0	0	0	2	0	1	1	0	14	5	6	1	10	3
104	0	3	0	6	0	3	1	3	24	18	6	8	5	11
105	1	1	0	5	0	6	0	5	18	12	2	5	2	12
106	0	1	0	3	0	5	1	0	13	10	4	5	5	8
107	1	1	0	6	0	2	0	3	20	12	12	5	7	18
108	0	1	0	1	0	1	0	4	8	3	6	2	3	3
109	0	0	0	8	0	1	1	3	12	12	10	2	8	6
110	0	0	0	0	1	5	0	2	11	4	7	5	6	5
111	0	1	0	1	1	1	0	1	11	10	5	7	3	8
112	0	0	0	0	0	1	1	2	16	7	2	5	5	4
113	0	0	0	2	1	3	6	0	10	8	6	1	5	2
114	0	0	0	1	0	1	1	1	16	6	10	2	7	4

Appendix B

Table B1. MLF made Natural Variations in Quran of the Specified Arabic names (constructed based on Table A statistics)

Chapter	الله	الرحمن	الرحيم	الحى	القيوم	العلى	غافر	فاطمه/فاطر	محمد	احمد	مسيح	عيسى	مريم	موسى	ابراهيم	نوح	حسن	مهدى
1	5	5	5	5	1	6	0	0	4	4	3	3	7	3	4	4	3	1
2	1198	330	330	330	553	797	75	99	330	330	330	452	876	452	876	330	330	330
3	665	173	173	173	306	383	62	50	173	173	173	228	510	228	510	173	173	218
4	768	198	198	198	255	404	62	65	198	198	198	307	491	307	479	198	198	181
5	531	173	173	173	265	338	47	52	173	173	173	215	381	215	381	173	173	182
6	610	162	162	162	271	369	50	52	162	162	162	213	506	213	454	162	162	207
7	629	166	166	166	356	400	67	56	166	166	166	300	534	300	509	166	166	229
8	259	54	54	54	109	162	25	22	54	54	54	71	187	71	174	54	54	95
9	652	138	138	138	216	313	37	34	138	138	138	194	412	194	350	138	138	145
10	310	100	100	100	181	211	20	17	100	100	100	130	257	130	239	100	100	115
11	329	88	88	88	180	244	34	28	88	88	88	123	325	123	284	88	88	96
12	348	103	103	103	193	218	28	19	103	103	103	167	245	167	257	103	103	81
13	175	44	44	44	87	99	15	12	44	44	44	71	130	71	137	44	44	47
14	141	35	35	35	57	95	13	11	35	35	35	77	153	77	135	35	35	53
15	97	44	44	44	83	80	8	11	41	41	44	67	96	67	96	44	44	22
16	378	91	91	91	131	230	23	25	91	91	91	139	289	139	270	91	91	122
17	228	90	90	90	155	187	21	29	90	90	90	148	222	148	228	90	90	87
18	315	107	107	107	151	206	36	39	107	107	107	124	246	124	272	107	107	106
19	149	65	65	65	86	117	16	13	65	65	65	66	145	66	149	65	65	54
20	215	77	77	77	162	172	17	28	77	77	77	120	189	120	180	77	77	65
21	264	77	77	77	105	150	14	17	77	77	77	100	190	100	162	77	77	76
22	279	59	59	59	98	164	14	30	59	59	59	95	204	95	179	59	59	89
23	213	63	63	63	109	129	18	17	60	60	63	67	183	67	167	63	63	72

24	300	85	85	85	61	179	27	24	85	85	85	90	176	90	176	85	85	85
25	140	46	46	46	89	109	9	11	46	46	46	82	123	82	137	46	46	87
26	171	61	61	61	133	204	18	33	51	51	61	94	218	94	171	61	61	85
27	228	54	54	54	120	134	11	27	54	54	54	94	194	94	153	54	54	56
28	275	73	73	73	147	177	25	19	73	73	73	102	218	102	170	73	73	52
29	196	52	52	52	92	114	9	17	52	52	52	71	118	71	118	52	52	67
30	148	45	45	45	77	93	8	9	45	45	45	71	142	71	111	45	45	59
31	107	32	32	32	31	63	14	6	32	32	32	38	86	38	76	32	32	20
32	66	13	13	13	38	45	1	2	13	13	13	32	66	32	51	13	13	29
33	276	68	68	68	111	151	18	24	68	68	68	92	195	92	163	68	68	81
34	126	38	38	38	94	114	14	10	38	38	38	60	145	60	126	38	38	67
35	156	43	43	43	42	78	18	8	43	43	43	67	126	67	104	43	43	58
36	141	42	42	42	72	83	12	14	42	42	42	48	123	48	72	42	42	45
37	165	58	58	58	80	111	12	21	58	58	58	73	129	73	129	58	58	57
38	121	54	54	54	74	98	15	20	54	54	54	54	104	54	121	54	54	62
39	256	63	63	63	115	125	13	11	63	63	63	95	172	95	172	63	63	88
40	204	64	64	64	107	142	19	12	64	64	64	100	190	100	204	64	64	91
41	144	48	48	48	81	102	10	8	48	48	48	65	118	65	96	48	48	56
42	170	53	53	53	57	98	14	10	53	53	53	54	141	54	130	53	53	57
43	178	44	44	44	84	121	3	10	44	44	44	72	133	72	133	44	44	55
44	60	16	16	16	35	47	5	5	15	15	16	23	63	23	60	16	16	19
45	97	31	31	31	36	60	7	3	21	21	31	40	63	40	63	31	31	30
46	119	36	36	36	73	79	10	4	36	36	36	48	98	48	95	36	36	48
47	141	25	25	25	38	73	11	16	25	25	25	36	95	36	73	25	25	43
48	129	33	33	33	47	82	15	9	33	33	33	53	98	53	71	33	33	33
49	65	22	22	22	32	43	8	6	17	17	22	30	46	30	46	22	22	10
50	55	28	28	28	57	45	7	6	28	28	28	28	54	28	54	28	28	23
51	64	19	19	19	46	39	6	7	18	18	19	37	67	37	37	19	19	33
52	59	19	19	19	28	38	8	7	17	17	19	27	60	27	60	19	19	20
53	62	18	18	18	17	34	14	7	18	18	18	30	47	30	44	18	18	23
54	51	23	23	23	48	53	5	8	23	23	23	33	55	33	51	23	23	42
55	40	15	15	15	22	18	4	10	7	7	15	18	56	30	40	15	15	40
56	37	43	43	43	35	44	4	7	18	18	23	23	64	23	37	43	23	16
57	121	29	29	29	49	61	12	5	29	29	29	47	109	47	89	29	29	30
58	124	31	31	31	27	54	5	8	31	31	31	39	53	39	53	31	31	36
59	116	25	25	25	44	38	6	4	25	25	25	35	75	35	65	25	25	29
60	73	22	22	22	27	33	9	3	22	22	22	24	52	24	51	22	22	17
61	51	15	15	15	19	18	3	4	15	15	15	18	39	22	31	15	15	15
62	36	12	12	12	14	16	2	0	12	12	9	9	24	9	18	12	9	16
63	49	8	8	8	23	20	4	1	8	8	8	20	28	22	15	8	8	13
64	51	18	18	18	14	33	8	4	15	15	18	20	42	20	39	18	18	16
65	79	25	25	25	28	44	2	3	25	25	25	28	39	28	35	25	25	15
66	57	18	18	18	17	33	7	2	18	18	11	11	43	11	44	18	11	11
67	56	17	17	17	36	36	6	6	17	17	17	28	56	28	49	17	17	32
68	49	21	21	21	21	42	8	11	21	21	21	26	50	26	49	21	21	19
69	54	22	22	22	29	38	5	9	12	12	22	22	40	22	37	22	22	17
70	50	12	12	12	16	38	4	2	12	12	12	15	39	15	31	12	12	23
71	35	5	5	5	21	25	8	5	5	5	5	21	40	21	28	5	5	10
72	58	18	18	18	25	37	5	8	18	18	18	27	37	27	37	18	18	7
73	38	7	7	7	24	20	5	5	7	7	7	18	27	18	23	7	7	12
74	37	12	12	12	25	22	2	3	12	12	12	22	37	23	33	12	12	25
75	22	7	7	7	27	16	1	2	6	6	7	16	21	26	22	7	7	15
76	48	14	14	14	15	26	1	12	14	14	14	26	38	32	36	14	14	15
77	18	5	5	5	18	22	1	4	5	5	5	9	34	9	18	5	5	18
78	19	14	14	14	17	19	3	3	11	11	14	17	27	17	19	14	14	12
79	35	14	14	14	11	19	4	7	14	14	14	19	25	20	27	14	14	14

80	19	7	7	7	13	13	4	3	5	5	7	11	23	11	20	7	7	9
81	8	10	10	10	8	12	1	4	4	4	10	11	15	17	8	10	10	8
82	6	5	5	5	3	8	2	1	5	5	5	7	15	7	6	5	5	6
83	27	8	8	8	13	18	1	2	5	5	8	15	32	15	27	8	8	20
84	22	10	10	10	15	8	1	2	5	5	10	8	15	15	24	10	10	10
85	25	11	11	11	6	14	1	2	11	11	3	3	17	3	15	11	3	12
86	12	3	3	3	9	5	0	2	3	3	3	5	11	6	7	3	3	2
87	11	9	9	9	6	5	1	0	4	4	9	5	7	11	9	9	9	9
88	14	6	6	6	3	18	3	3	1	1	6	11	14	11	14	6	6	6
89	18	9	9	9	10	16	1	4	9	9	9	9	17	9	18	9	9	18
90	11	11	11	11	10	7	1	1	11	11	8	7	12	8	11	11	8	7
91	12	5	5	5	6	4	2	2	5	5	5	3	6	6	6	5	5	6
92	13	5	5	5	5	8	4	1	5	5	5	8	8	13	9	5	5	9
93	4	4	4	4	2	4	1	1	4	4	4	4	6	4	4	4	4	1
94	2	3	3	3	1	5	2	0	1	1	3	2	3	5	2	3	3	2
95	5	6	6	6	3	2	1	1	6	6	6	2	6	7	5	6	6	3
96	8	2	2	2	7	12	2	2	2	2	2	9	8	7	8	2	2	6
97	6	4	4	4	3	1	0	1	4	4	2	1	6	2	3	3	2	1
98	23	7	7	7	4	7	0	1	7	7	2	2	16	2	14	7	2	6
99	9	4	4	4	4	3	0	0	2	2	3	3	7	3	4	4	3	5
100	9	7	7	7	3	6	1	1	6	7	3	3	6	3	9	7	3	3
101	7	3	3	3	4	5	0	0	2	2	2	2	9	2	3	3	2	0
102	3	4	4	4	3	7	0	0	0	0	4	4	7	4	2	4	4	1
103	1	4	3	3	1	2	0	0	0	0	3	1	2	3	1	4	3	1
104	8	4	4	5	1	6	0	3	5	5	2	2	4	2	3	5	2	2
105	5	2	4	4	0	5	0	1	1	1	3	3	6	2	5	2	2	0
106	5	3	3	3	1	3	0	1	1	1	1	1	5	1	4	3	1	2
107	5	3	3	3	0	6	0	1	2	2	3	3	4	3	3	3	3	5
108	2	3	3	3	0	1	0	1	0	0	1	1	1	1	2	3	1	0
109	2	2	2	2	1	6	0	0	2	2	1	1	3	1	2	2	1	0
110	5	4	4	5	0	0	1	0	2	3	4	0	2	4	4	5	4	1
111	5	4	4	5	0	1	1	1	3	3	4	1	4	3	4	3	4	1
112	5	2	2	4	1	0	0	0	3	4	1	0	2	1	1	2	1	0
113	1	4	2	2	2	2	1	0	3	3	2	1	2	2	1	4	4	1
114	2	2	2	2	1	1	0	0	1	1	2	1	3	4	2	2	2	2

Table B2. MLF made Natural Variations in Quran of the Specified non-Arabic names (constructed based on Table A statistics)

Chapter	البرت Albert	ورنر Werner	مکس Max	ستفلن Stephen	جیمزکلرک James Clerk	اروین Erwin	ادوارد Edward	بابک Baback
2	876	438	452	452	107	876	229	459
3	510	255	228	228	67	510	126	287
4	479	245	307	307	51	491	150	239
5	381	190	215	215	57	381	115	197
6	454	253	213	213	66	506	99	227
7	509	267	300	300	41	534	123	254
8	174	93	71	71	23	187	43	87
9	350	206	194	194	55	412	103	175
10	239	128	130	130	26	257	63	119
11	284	162	123	123	35	325	73	142
12	257	128	167	167	34	257	70	135
13	120	68	71	71	21	137	38	76
14	132	80	77	77	21	160	36	67
15	91	48	67	64	19	96	20	50
16	270	144	139	139	45	289	61	135
17	253	150	148	148	38	301	71	129

18	272	138	124	124	33	277	85	136
19	155	84	66	66	19	169	49	77
20	180	106	120	120	30	212	51	90
21	162	95	100	100	17	190	48	81
22	177	102	95	95	26	204	48	89
23	167	91	67	67	17	183	30	83
24	176	88	90	90	33	176	44	104
25	132	97	82	73	21	194	32	68
26	190	109	94	94	40	218	25	95
27	153	97	94	94	19	194	49	76
28	170	109	102	102	19	218	62	85
29	118	59	71	71	21	118	32	74
30	111	71	71	71	15	142	25	55
31	76	45	38	38	14	91	23	38
32	51	33	32	32	8	66	12	25
33	163	97	92	92	32	195	52	81
34	108	76	60	60	30	153	38	71
35	104	79	67	67	30	159	31	52
36	72	61	48	48	18	123	25	36
37	123	64	73	73	23	129	29	78
38	89	63	54	54	20	127	34	74
39	172	86	95	95	34	172	44	89
40	167	105	100	100	23	211	57	106
41	96	59	65	65	23	118	34	48
42	106	70	54	54	22	141	32	65
43	133	66	72	72	11	133	31	70
44	53	31	23	23	10	63	7	31
45	63	31	40	40	16	63	10	35
46	95	49	48	48	13	98	28	47
47	73	47	36	36	9	95	17	36
48	71	49	53	53	18	98	29	35
49	46	23	30	30	3	46	8	26
50	48	27	28	28	7	54	29	38
51	37	33	37	37	5	67	9	18
52	47	30	27	27	4	60	8	32
53	44	23	30	30	12	47	14	22
54	52	54	33	33	11	83	23	29
55	66	43	30	30	7	68	3	62
56	62	32	23	23	13	64	9	31
57	89	60	47	47	12	120	18	44
58	53	26	39	39	13	53	18	31
59	57	39	35	35	10	79	15	32
60	51	26	24	24	5	52	15	25
61	31	21	22	22	5	43	9	15
62	18	12	9	9	3	24	6	9
63	15	14	22	22	4	28	6	7
64	39	21	20	20	6	42	7	19
65	35	26	28	27	6	52	16	17
66	44	25	11	11	5	50	9	22
67	40	36	28	28	10	72	8	24
68	46	25	26	26	4	50	14	28
69	37	20	22	22	3	40	6	18
70	25	19	15	15	4	39	9	15
71	28	31	21	18	4	58	12	14
72	19	25	19	19	3	50	27	18
73	23	24	18	18	3	49	5	11

74	33	35	23	23	3	66	13	16
75	27	17	16	19	2	34	3	15
76	35	33	32	26	9	67	9	18
77	23	17	9	9	1	34	4	11
78	28	14	17	17	6	28	5	20
79	27	21	20	20	4	41	8	13
80	20	16	11	11	3	32	2	10
81	16	10	9	8	2	20	2	8
82	13	10	7	7	0	21	4	7
83	20	16	15	15	3	32	2	14
84	16	13	11	13	0	26	2	11
85	14	8	3	3	3	17	11	7
86	5	8	6	5	1	15	4	3
87	8	10	9	8	1	14	2	4
88	14	9	10	11	1	19	0	7
89	23	16	9	9	1	24	9	13
90	12	6	8	6	0	12	7	8
91	4	4	3	4	1	6	3	3
92	9	7	6	5	2	14	2	4
93	5	5	4	4	0	5	3	2
94	1	5	5	1	0	5	0	2
95	4	3	4	4	1	6	3	3
96	14	7	9	2	1	7	3	7
97	3	3	2	2	1	3	2	1
98	14	10	2	2	2	21	4	7
99	4	7	1	1	0	7	1	1
100	3	6	2	3	0	10	3	2
101	3	5	2	2	1	10	1	1
102	2	3	4	2	1	7	0	1
103	3	2	0	1	0	3	0	0
104	3	2	2	2	1	4	4	1
105	4	2	3	2	0	2	0	3
106	3	2	0	1	0	4	0	0
107	3	2	3	2	0	4	1	1
108	1	3	1	1	0	3	0	1
109	3	1	1	1	0	3	3	3
110	4	3	2	4	0	5	1	2
111	4	2	1	1	0	3	1	1
112	0	1	1	0	0	2	2	0
113	1	3	0	1	0	2	1	0
114	1	2	1	1	0	4	0	1

Appendix C

Sample SF-analysis of the SV of Names Using Minitab and Tabulation of the Computed F-parameters

Table C1. A typical Minitab worksheet: Data columns and Fourier base functions used for linear regression

C1	C2	C3	C4	C5	..	..	..	..	..	..	..	..	..	..
n	(2πn) / 114	NV محمد	SV محمد	ln(SV-Muhammad)	sin(1*c2)	cos(1*c2)	sin(2*c2)	cos(2*c2)	...	sin(34*c2)	cos(34*c2)	...	sin(56*c2)	cos(56*c2)
1	0.055	4	0	*	0.055	0.998	0.110	0.994	...	0.954	-0.299	...	0.055	-0.998
2	0.110	330	0	*	0.110	0.994	0.219	0.976	...	-0.570	-0.822	...	-0.110	0.994
3	0.165	173	0	*	0.165	0.986	0.325	0.946	...	-0.614	0.789	...	0.165	-0.986
4	0.220	198	1	0.000	0.219	0.976	0.427	0.904	...	0.937	0.351	...	-0.219	0.976
5	0.276	173	1	0.000	0.272	0.962	0.524	0.852	...	0.055	-0.998	...	0.272	-0.962
6	0.331	162	1	0.000	0.325	0.946	0.614	0.789	...	-0.969	0.245	...	-0.325	0.946

7	0.386	166	1	0.000	0.376	0.926	0.697	0.717	...	0.524	0.852	...	0.376	-0.926
8	0.441	54	1	0.000	0.427	0.904	0.772	0.636	...	0.657	-0.754	...	-0.427	0.904
9	0.496	138	2	0.693	0.476	0.879	0.837	0.547	...	-0.916	-0.402	...	0.476	-0.879
10	0.551	100	2	0.693	0.524	0.852	0.892	0.452	...	-0.110	0.994	...	-0.524	0.852
11	0.606	88	2	0.693	0.570	0.822	0.937	0.351	...	0.981	-0.192	...	0.570	-0.822
12	0.661	103	2	0.693	0.614	0.789	0.969	0.245	...	-0.476	-0.879	...	-0.614	0.789
13	0.717	44	2	0.693	0.657	0.754	0.991	0.137	...	-0.697	0.717	...	0.657	-0.754
14	0.772	35	2	0.693	0.697	0.717	1.000	0.028	...	0.892	0.452	...	-0.697	0.717
15	0.827	41	3	1.099	0.736	0.677	0.997	-0.083	...	0.165	-0.986	...	0.736	-0.677
16	0.882	91	3	1.099	0.772	0.636	0.981	-0.192	...	-0.991	0.137	...	-0.772	0.636
17	0.937	90	3	1.099	0.806	0.592	0.954	-0.299	...	0.427	0.904	...	0.806	-0.592
18	0.992	107	3	1.099	0.837	0.547	0.916	-0.402	...	0.736	-0.677	...	-0.837	0.547
19	1.047	65	4	1.386	0.866	0.500	0.866	-0.500	...	-0.866	-0.500	...	0.866	-0.500
20	1.102	77	4	1.386	0.892	0.452	0.806	-0.592	...	-0.219	0.976	...	-0.892	0.452
21	1.157	77	4	1.386	0.916	0.402	0.736	-0.677	...	0.997	-0.083	...	0.916	-0.402
22	1.213	59	4	1.386	0.937	0.351	0.657	-0.754	...	-0.376	-0.926	...	-0.937	0.351
23	1.268	60	4	1.386	0.954	0.299	0.570	-0.822	...	-0.772	0.636	...	0.954	-0.299
24	1.323	85	5	1.609	0.969	0.245	0.476	-0.879	...	0.837	0.547	...	-0.969	0.245
25	1.378	46	5	1.609	0.981	0.192	0.376	-0.926	...	0.272	-0.962	...	0.981	-0.192
26	1.433	51	5	1.609	0.991	0.137	0.272	-0.962	...	-1.000	0.028	...	-0.991	0.137
27	1.488	54	5	1.609	0.997	0.083	0.165	-0.986	...	0.325	0.946	...	0.997	-0.083
28	1.543	73	5	1.609	1.000	0.028	0.055	-0.998	...	0.806	-0.592	...	-1.000	0.028
29	1.598	52	5	1.609	1.000	-0.028	-0.055	-0.998	...	-0.806	-0.592	...	1.000	0.028
30	1.653	45	5	1.609	0.997	-0.083	-0.165	-0.986	...	-0.325	0.946	...	-0.997	-0.083
31	1.709	32	5	1.609	0.991	-0.137	-0.272	-0.962	...	1.000	0.028	...	0.991	0.137
32	1.764	13	5	1.609	0.981	-0.192	-0.376	-0.926	...	-0.272	-0.962	...	-0.981	-0.192
33	1.819	68	6	1.792	0.969	-0.245	-0.476	-0.879	...	-0.837	0.547	...	0.969	0.245
34	1.874	38	6	1.792	0.954	-0.299	-0.570	-0.822	...	0.772	0.636	...	-0.954	-0.299
35	1.929	43	6	1.792	0.937	-0.351	-0.657	-0.754	...	0.376	-0.926	...	0.937	0.351
36	1.984	42	7	1.946	0.916	-0.402	-0.736	-0.677	...	-0.997	-0.083	...	-0.916	-0.402
37	2.039	58	7	1.946	0.892	-0.452	-0.806	-0.592	...	0.219	0.976	...	0.892	0.452
38	2.094	54	7	1.946	0.866	-0.500	-0.866	-0.500	...	0.866	-0.500	...	-0.866	-0.500
39	2.150	63	8	2.079	0.837	-0.547	-0.916	-0.402	...	-0.736	-0.677	...	0.837	0.547
40	2.205	64	9	2.197	0.806	-0.592	-0.954	-0.299	...	-0.427	0.904	...	-0.806	-0.592
41	2.260	48	11	2.398	0.772	-0.636	-0.981	-0.192	...	0.991	0.137	...	0.772	0.636
42	2.315	53	11	2.398	0.736	-0.677	-0.997	-0.083	...	-0.165	-0.986	...	-0.736	-0.677
43	2.370	44	11	2.398	0.697	-0.717	-1.000	0.028	...	-0.892	0.452	...	0.697	0.717
44	2.425	15	12	2.485	0.657	-0.754	-0.991	0.137	...	0.697	0.717	...	-0.657	-0.754
45	2.480	21	12	2.485	0.614	-0.789	-0.969	0.245	...	0.476	-0.879	...	0.614	0.789
46	2.535	36	12	2.485	0.570	-0.822	-0.937	0.351	...	-0.981	-0.192	...	-0.570	-0.822
47	2.590	25	12	2.485	0.524	-0.852	-0.892	0.452	...	0.110	0.994	...	0.524	0.852
48	2.646	33	13	2.565	0.476	-0.879	-0.837	0.547	...	0.916	-0.402	...	-0.476	-0.879
49	2.701	17	14	2.639	0.427	-0.904	-0.772	0.636	...	-0.657	-0.754	...	0.427	0.904
50	2.756	28	14	2.639	0.376	-0.926	-0.697	0.717	...	-0.524	0.852	...	-0.376	-0.926
51	2.811	18	15	2.708	0.325	-0.946	-0.614	0.789	...	0.969	0.245	...	0.325	0.946
52	2.866	17	15	2.708	0.272	-0.962	-0.524	0.852	...	-0.055	-0.998	...	-0.272	-0.962
53	2.921	18	15	2.708	0.219	-0.976	-0.427	0.904	...	-0.937	0.351	...	0.219	0.976
54	2.976	23	17	2.833	0.165	-0.986	-0.325	0.946	...	0.614	0.789	...	-0.165	-0.986
55	3.031	7	17	2.833	0.110	-0.994	-0.219	0.976	...	0.570	-0.822	...	0.110	0.994
56	3.086	18	17	2.833	0.055	-0.998	-0.110	0.994	...	-0.954	-0.299	...	-0.055	-0.998
57	3.142	29	18	2.890	0.000	-1.000	0.000	1.000	...	0.000	1.000	...	0.000	1.000
58	3.197	31	18	2.890	-0.055	-0.998	0.110	0.994	...	0.954	-0.299	...	0.055	-0.998
59	3.252	25	18	2.890	-0.110	-0.994	0.219	0.976	...	-0.570	-0.822	...	-0.110	0.994
60	3.307	22	18	2.890	-0.165	-0.986	0.325	0.946	...	-0.614	0.789	...	0.165	-0.986
61	3.362	15	18	2.890	-0.219	-0.976	0.427	0.904	...	0.937	0.351	...	-0.219	0.976
62	3.417	12	21	3.045	-0.272	-0.962	0.524	0.852	...	0.055	-0.998	...	0.272	-0.962

63	3.472	8	21	3.045	-0.325	-0.946	0.614	0.789	**...**	-0.969	0.245	**...**	-0.325	0.946
64	3.527	15	22	3.091	-0.376	-0.926	0.697	0.717	**...**	0.524	0.852	**...**	0.376	-0.926
65	3.583	25	23	3.135	-0.427	-0.904	0.772	0.636	**...**	0.657	-0.754	**...**	-0.427	0.904
66	3.638	18	25	3.219	-0.476	-0.879	0.837	0.547	**...**	-0.916	-0.402	**...**	0.476	-0.879
67	3.693	17	25	3.219	-0.524	-0.852	0.892	0.452	**...**	-0.110	0.994	**...**	-0.524	0.852
68	3.748	21	25	3.219	-0.570	-0.822	0.937	0.351	**...**	0.981	-0.192	**...**	0.570	-0.822
69	3.803	12	28	3.332	-0.614	-0.789	0.969	0.245	**...**	-0.476	-0.879	**...**	-0.614	0.789
70	3.858	12	29	3.367	-0.657	-0.754	0.991	0.137	**...**	-0.697	0.717	**...**	0.657	-0.754
71	3.913	5	31	3.434	-0.697	-0.717	1.000	0.028	**...**	0.892	0.452	**...**	-0.697	0.717
72	3.968	18	32	3.466	-0.736	-0.677	0.997	-0.083	**...**	0.165	-0.986	**...**	0.736	-0.677
73	4.023	7	33	3.497	-0.772	-0.636	0.981	-0.192	**...**	-0.991	0.137	**...**	-0.772	0.636
74	4.079	12	35	3.555	-0.806	-0.592	0.954	-0.299	**...**	0.427	0.904	**...**	0.806	-0.592
75	4.134	6	36	3.584	-0.837	-0.547	0.916	-0.402	**...**	0.736	-0.677	**...**	-0.837	0.547
76	4.189	14	38	3.638	-0.866	-0.500	0.866	-0.500	**...**	-0.866	-0.500	**...**	0.866	-0.500
77	4.244	5	41	3.714	-0.892	-0.452	0.806	-0.592	**...**	-0.219	0.976	**...**	-0.892	0.452
78	4.299	11	42	3.738	-0.916	-0.402	0.736	-0.677	**...**	0.997	-0.083	**...**	0.916	-0.402
79	4.354	14	43	3.761	-0.937	-0.351	0.657	-0.754	**...**	-0.376	-0.926	**...**	-0.937	0.351
80	4.409	5	44	3.784	-0.954	-0.299	0.570	-0.822	**...**	-0.772	0.636	**...**	0.954	-0.299
81	4.464	4	44	3.784	-0.969	-0.245	0.476	-0.879	**...**	0.837	0.547	**...**	-0.969	0.245
82	4.519	5	45	3.807	-0.981	-0.192	0.376	-0.926	**...**	0.272	-0.962	**...**	0.981	-0.192
83	4.575	5	46	3.829	-0.991	-0.137	0.272	-0.962	**...**	-1.000	0.028	**...**	-0.991	0.137
84	4.630	5	48	3.871	-0.997	-0.083	0.165	-0.986	**...**	0.325	0.946	**...**	0.997	-0.083
85	4.685	11	51	3.932	-1.000	-0.028	0.055	-0.998	**...**	0.806	-0.592	**...**	-1.000	0.028
86	4.740	3	52	3.951	-1.000	0.028	-0.055	-0.998	**...**	-0.806	-0.592	**...**	1.000	0.028
87	4.795	4	53	3.970	-0.997	0.083	-0.165	-0.986	**...**	-0.325	0.946	**...**	-0.997	-0.083
88	4.850	1	54	3.989	-0.991	0.137	-0.272	-0.962	**...**	1.000	0.028	**...**	0.991	0.137
89	4.905	9	54	3.989	-0.981	0.192	-0.376	-0.926	**...**	-0.272	-0.962	**...**	-0.981	-0.192
90	4.960	11	54	3.989	-0.969	0.245	-0.476	-0.879	**...**	-0.837	0.547	**...**	0.969	0.245
91	5.016	5	58	4.060	-0.954	0.299	-0.570	-0.822	**...**	0.772	0.636	**...**	-0.954	-0.299
92	5.071	5	59	4.078	-0.937	0.351	-0.657	-0.754	**...**	0.376	-0.926	**...**	0.937	0.351
93	5.126	4	60	4.094	-0.916	0.402	-0.736	-0.677	**...**	-0.997	-0.083	**...**	-0.916	-0.402
94	5.181	1	63	4.143	-0.892	0.452	-0.806	-0.592	**...**	0.219	0.976	**...**	0.892	0.452
95	5.236	6	64	4.159	-0.866	0.500	-0.866	-0.500	**...**	0.866	-0.500	**...**	-0.866	-0.500
96	5.291	2	65	4.174	-0.837	0.547	-0.916	-0.402	**...**	-0.736	-0.677	**...**	0.837	0.547
97	5.346	4	68	4.220	-0.806	0.592	-0.954	-0.299	**...**	-0.427	0.904	**...**	-0.806	-0.592
98	5.401	7	73	4.290	-0.772	0.636	-0.981	-0.192	**...**	0.991	0.137	**...**	0.772	0.636
99	5.456	2	77	4.344	-0.736	0.677	-0.997	-0.083	**...**	-0.165	-0.986	**...**	-0.736	-0.677
100	5.512	6	77	4.344	-0.697	0.717	-1.000	0.028	**...**	-0.892	0.452	**...**	0.697	0.717
101	5.567	2	85	4.443	-0.657	0.754	-0.991	0.137	**...**	0.697	0.717	**...**	-0.657	-0.754
102	5.622	0	88	4.477	-0.614	0.789	-0.969	0.245	**...**	0.476	-0.879	**...**	0.614	0.789
103	5.677	0	90	4.500	-0.570	0.822	-0.937	0.351	**...**	-0.981	-0.192	**...**	-0.570	-0.822
104	5.732	5	91	4.511	-0.524	0.852	-0.892	0.452	**...**	0.110	0.994	**...**	0.524	0.852
105	5.787	1	100	4.605	-0.476	0.879	-0.837	0.547	**...**	0.916	-0.402	**...**	-0.476	-0.879
106	5.842	1	103	4.635	-0.427	0.904	-0.772	0.636	**...**	-0.657	-0.754	**...**	0.427	0.904
107	5.897	2	107	4.673	-0.376	0.926	-0.697	0.717	**...**	-0.524	0.852	**...**	-0.376	-0.926
108	5.952	0	138	4.927	-0.325	0.946	-0.614	0.789	**...**	0.969	0.245	**...**	0.325	0.946
109	6.008	2	162	5.088	-0.272	0.962	-0.524	0.852	**...**	-0.055	-0.998	**...**	-0.272	-0.962
110	6.063	2	166	5.112	-0.219	0.976	-0.427	0.904	**...**	-0.937	0.351	**...**	0.219	0.976
111	6.118	3	173	5.153	-0.165	0.986	-0.325	0.946	**...**	0.614	0.789	**...**	-0.165	-0.986
112	6.173	3	173	5.153	-0.110	0.994	-0.219	0.976	**...**	0.570	-0.822	**...**	0.110	0.994
113	6.228	3	198	5.288	-0.055	0.998	-0.110	0.994	**...**	-0.954	-0.299	**...**	-0.055	-0.998
114	6.283	1	330	5.799	0.000	1.000	0.000	1.000	**...**	0.000	1.000	**...**	0.000	1.000

Example of a Typical Stepwise Fourier Regression Analysis (SF-analysis) by Minitab:

In the following we present a typical Minitab 16 "session window", showing results of the stepwise linear regression (SF-analysis) of the ln of the Sorted Variation (SV) of the name Muhammad, using the linear and Fourier term base functions shown in Table C1. The blue colored F-parameter shows the computed **K(J)**, and the red colored F-parameter shows the computed **beta(J)** (notice that, alpha=1/beta). The computed linear term coefficient beta(J) values for SV of Muhammad can also be observed in the following Table C3.

Regression Analysis: ln(SV-Muhammad) versus n (corresponding to J=0)

The regression equation is

ln(SV-Muhammad)= 0.338 + 0.0425 n

111 cases used, 3 cases contain missing values

Predictor	Coef	SE Coef	T	P
Constant	0.33760	0.03964	8.52	0.000
n	0.0424889	0.0005903	71.97	0.000

S = 0.199289 R-Sq = 97.9% R-Sq(adj) = 97.9%

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	1	205.73	205.73	5180.09	0.000
Residual Error	109	4.33	0.04		
Total	110	210.06			

Regression Analysis: ln(SV-Muhammad) versus n; sin(1*c2); cos(1*c2) (corresponding to J=2)

The regression equation is

ln(SV-Muhammad)= 0.0612 + 0.0471 n + 0.239 sin(1*c2) - 0.163 cos(1*c2)

111 cases used, 3 cases contain missing values

Predictor	Coef	SE Coef	T	P
Constant	0.06118	0.04313	1.42	0.159
n	0.0471118	0.0006963	67.66	0.000
sin(1*c2)	0.23900	0.03102	7.71	0.000
cos(1*c2)	-0.16346	0.01901	-8.60	0.000

S = 0.138181 R-Sq = 99.0% R-Sq(adj) = 99.0%

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	3	208.019	69.340	3631.47	0.000
Residual Error	107	2.043	0.019		
Total	110	210.062			

Regression Analysis: ln(SV-Muhammad) versus n; sin(1*c2); ... (corresponding to J=4)

The regression equation is

ln(SV-Muhammad)= **- 0.167** + **0.0510 n** + 0.378 sin(1*c2) - 0.180 cos(1*c2)

+ 0.141 sin(2*c2) - 0.0498 cos(2*c2)

The rest of analysis information is omitted…..

Regression Analysis: ln(SV-Muhammad) versus n; sin(1*c2); ... (corresponding to J=18)

The regression equation is

ln(SV-Muhammad)= **- 0.352** + **0.0541 n** + 0.491 sin(1*c2) - 0.190 cos(1*c2)

+ 0.197 sin(2*c2) - 0.0598 cos(2*c2) + 0.110 sin(3*c2)

- 0.0249 cos(3*c2) - 0.0270 sin(4*c2) - 0.0255 cos(4*c2)

+ 0.0076 sin(5*c2) + 0.0304 cos(5*c2) + 0.0253 sin(6*c2)

+ 0.0122 cos(6*c2) + 0.0023 sin(7*c2) - 0.0095 cos(7*c2)

- 0.0103 sin(8*c2) + 0.0156 cos(8*c2) + 0.0082 sin(9*c2)

+ 0.0098 cos(9*c2)

The rest of analysis information is omitted…..

Regression Analysis: ln(SV-Muhammad) versus n; sin(1*c2); ... (corresponding to J=36)

The regression equation is

ln(SV-Muhammad)= **- 0.969** **+** **0.0648** n + 0.877 sin(1*c2) - 0.211 cos(1*c2)

+ 0.389 sin(2*c2) - 0.0806 cos(2*c2) + 0.237 sin(3*c2)

- 0.0457 cos(3*c2) + 0.0674 sin(4*c2) - 0.0462 cos(4*c2)

+ 0.0820 sin(5*c2) + 0.0096 cos(5*c2) + 0.0863 sin(6*c2)

- 0.0085 cos(6*c2) + 0.0534 sin(7*c2) - 0.0301 cos(7*c2)

+ 0.0333 sin(8*c2) - 0.0051 cos(8*c2) + 0.0457 sin(9*c2)

- 0.0107 cos(9*c2) + 0.0226 sin(10*c2) - 0.0151 cos(10*c2)

+ 0.0400 sin(11*c2) - 0.0161 cos(11*c2) + 0.0319 sin(12*c2)

- 0.0196 cos(12*c2) + 0.0337 sin(13*c2) - 0.0127 cos(13*c2)

+ 0.0489 sin(14*c2) - 0.0226 cos(14*c2) + 0.0437 sin(15*c2)

- 0.0469 cos(15*c2) + 0.0215 sin(16*c2) - 0.0224 cos(16*c2)

+ 0.0195 sin(17*c2) - 0.0316 cos(17*c2) + 0.00956 sin(18*c2)

- 0.0283 cos(18*c2)

Regression Analysis: ln(SV-Muhammad) versus n; sin(1*c2); ... (corresponding to J=108)

The regression equation is

ln(SV-Muhammad)= **- 1123** **+** **19.0** **n** + 685 sin(1*c2) - 79.0 cos(1*c2)

+ 334 sin(2*c2) - 78.2 cos(2*c2) + 214 sin(3*c2)

- 76.9 cos(3*c2) + 152 sin(4*c2) - 75.2 cos(4*c2)

+ 113 sin(5*c2) - 72.9 cos(5*c2) + 85.5 sin(6*c2)

- 70.4 cos(6*c2) + 65.0 sin(7*c2) - 67.5 cos(7*c2)

+ 49.0 sin(8*c2) - 64.1 cos(8*c2) + 36.1 sin(9*c2)

- 60.6 cos(9*c2) + 25.5 sin(10*c2) - 56.8 cos(10*c2)

+ 16.7 sin(11*c2) - 52.7 cos(11*c2) + 9.4 sin(12*c2)

- 48.6 cos(12*c2) + 3.41 sin(13*c2) - 44.4 cos(13*c2)

- 1.54 sin(14*c2) - 40.1 cos(14*c2) - 5.57 sin(15*c2)

- 35.9 cos(15*c2) - 8.79 sin(16*c2) - 31.7 cos(16*c2)

- 11.3 sin(17*c2) - 27.7 cos(17*c2) - 13.1 sin(18*c2)

- 23.8 cos(18*c2) - 14.3 sin(19*c2) - 20.1 cos(19*c2)

- 15.1 sin(20*c2) - 16.7 cos(20*c2) - 15.4 sin(21*c2)

- 13.4 cos(21*c2) - 15.3 sin(22*c2) - 10.5 cos(22*c2)

- 14.9 sin(23*c2) - 7.81 cos(23*c2) - 14.2 sin(24*c2)

- 5.46 cos(24*c2) - 13.3 sin(25*c2) - 3.40 cos(25*c2)

- 12.3 sin(26*c2) - 1.64 cos(26*c2) - 11.2 sin(27*c2)

- 0.16 cos(27*c2) - 10.0 sin(28*c2) + 1.06 cos(28*c2)

- 8.78 sin(29*c2) + 2.01 cos(29*c2) - 7.58 sin(30*c2)

+ 2.71 cos(30*c2) - 6.40 sin(31*c2) + 3.21 cos(31*c2)

- 5.29 sin(32*c2) + 3.49 cos(32*c2) - 4.27 sin(33*c2)

+ 3.63 cos(33*c2) - 3.33 sin(34*c2) + 3.63 cos(34*c2)

- 2.50 sin(35*c2) + 3.52 cos(35*c2) - 1.77 sin(36*c2)
+ 3.31 cos(36*c2) - 1.16 sin(37*c2) + 3.03 cos(37*c2)
- 0.65 sin(38*c2) + 2.71 cos(38*c2) - 0.243 sin(39*c2)
+ 2.34 cos(39*c2) + 0.046 sin(40*c2) + 1.99 cos(40*c2)
+ 0.254 sin(41*c2) + 1.64 cos(41*c2) + 0.396 sin(42*c2)
+ 1.31 cos(42*c2) + 0.464 sin(43*c2) + 1.00 cos(43*c2)
+ 0.476 sin(44*c2) + 0.752 cos(44*c2) + 0.465 sin(45*c2)
+ 0.524 cos(45*c2) + 0.405 sin(46*c2) + 0.350 cos(46*c2)
+ 0.347 sin(47*c2) + 0.213 cos(47*c2) + 0.284 sin(48*c2)
+ 0.112 cos(48*c2) + 0.211 sin(49*c2) + 0.035 cos(49*c2)
+ 0.146 sin(50*c2) - 0.0039 cos(50*c2) + 0.0826 sin(51*c2)
- 0.0201 cos(51*c2) + 0.0459 sin(52*c2) - 0.0198 cos(52*c2)
+ 0.0207 sin(53*c2) - 0.0115 cos(53*c2) + 0.00778 sin(54*c2)
- 0.00909 cos(54*c2)

Note 1: Computation has made a Natural Termination (NT) at J=108 (=2×54) for the SF-analysis of the Sorted Variation of the name "Muhammad محمد" (see Natural Termination in the CS-article).

Note 2: The following two computations are performed for J=19, once with the sine and once with the cosine Fourier term as the 19th term (as explained in the CS-article in procedures of SF-analysis). Of course only one of the results, not both, is used in the F-plots. The same is done for J=57 and J=95 in all regression computations.

Regression Analysis: ln(SV-Muhammad) versus n; sin(1*c2); ... (corresponding to J=19, with sine term)

The regression equation is

ln(SV-Muhammad)= **- 0.328** **+ 0.0537** n + 0.476 sin(1*c2) - 0.189 cos(1*c2)
+ 0.190 sin(2*c2) - 0.0591 cos(2*c2) + 0.105 sin(3*c2)
- 0.0242 cos(3*c2) - 0.0306 sin(4*c2) - 0.0247 cos(4*c2)
+ 0.0047 sin(5*c2) + 0.0311 cos(5*c2) + 0.0229 sin(6*c2)
+ 0.0130 cos(6*c2) + 0.0003 sin(7*c2) - 0.0087 cos(7*c2)
- 0.0120 sin(8*c2) + 0.0163 cos(8*c2) + 0.0068 sin(9*c2)
+ 0.0106 cos(9*c2) - 0.0112 sin(10*c2)

Regression Analysis: ln(SV-Muhammad) versus n; sin(1*c2); ... (corresponding to J=19, with cosine term)

The regression equation is

ln(SV-Muhammad)= **- 0.323** **+ 0.0536** n + 0.474 sin(1*c2) - 0.188 cos(1*c2)
+ 0.188 sin(2*c2) - 0.0576 cos(2*c2) + 0.105 sin(3*c2)
- 0.0228 cos(3*c2) - 0.0307 sin(4*c2) - 0.0234 cos(4*c2)
+ 0.0049 sin(5*c2) + 0.0324 cos(5*c2) + 0.0233 sin(6*c2)
+ 0.0141 cos(6*c2) + 0.0008 sin(7*c2) - 0.0077 cos(7*c2)
- 0.0113 sin(8*c2) + 0.0172 cos(8*c2) + 0.0075 sin(9*c2)
+ 0.0114 cos(9*c2) + 0.0067 cos(10*c2

Minitab Computed, beta and K, F-parameters for the specified names

In Tables C1-C3, Minitab-computed full results of beta(J) and some results of K(J), computed for the SVs of the names specified on the top row are presented.

Table C2. F-parameters K(e)SV and beta(e)SV, computed for the MLF made Sorted Variations in Quran of the specified Arabic names

J	K-الله	β-الله	K-قيوم	β-قيوم	K-نور	β-نور	β-الرحمن	β-الرحيم	β-حى	β-على	β-(فاطمه/فاطر)	β-غافر

0	1.0878	0.0486	0.3389	0.0487	1.3549	0.0438	0.037756	0.037862	0.037375	0.046806	0.0400	0.041687
2	0.7588	0.0543	-0.2219	0.0578	1.0231	0.0496	0.039782	0.039925	0.039311	0.052994	0.0463	0.048385
4	0.6469	0.0562	-0.3433	0.0597	1.0337	0.0494	0.041585	0.04165	0.041299	0.056235	0.0460	0.045896
6	0.4737	0.0592	-0.3944	0.0606	0.9635	0.0506	0.043518	0.043453	0.043307	0.060016	0.0446	0.041336
8	0.3820	0.0608	-0.3677	0.0602	0.9252	0.0513	0.044182	0.044009	0.043806	0.061826	0.0449	0.04475
10	0.2644	0.0629	-0.3753	0.0603	0.8580	0.0525	0.044706	0.044498	0.044126	0.064257	0.0471	0.05777
12	0.2539	0.0631	-0.2195	0.0577	0.8369	0.0528	0.044716	0.044564	0.044188	0.062056	0.0535	0.04347
14	0.2352	0.0634	0.0051	0.0541	0.8416	0.0527	0.044557	0.044528	0.044412	0.061716	0.0812	0.040805
16	0.2689	0.0628	0.0128	0.0540	0.8292	0.0530	0.04445	0.044559	0.044797	0.061671	0.0801	-0.01387
18	0.2959	0.0623	-0.0295	0.0548	0.8307	0.0529	0.044501	0.044706	0.045139	0.060496	0.0564	-0.02824
19	0.3227	0.0619	-0.2901	0.0591	0.8320	0.0529	0.044337	0.044517	0.044854	0.06090	0.0165	-0.02807
20	0.3262	0.0618	-0.2563	0.0586	0.8102	0.0533	0.044317	0.044536	0.044935	0.060543	0.0438	0.083617
22	0.3510	0.0614	-0.6673	0.0655	0.8153	0.0532	0.044288	0.044433	0.04475	0.060015	0.1127	0.359275
24	0.3069	0.0621	-1.3098	0.0762	0.7885	0.0537	0.044558	0.044568	0.044999	0.061164	0.3538	0.016431
26	0.2943	0.0624	-1.6843	0.0824	0.7881	0.0537	0.044564	0.044431	0.045217	0.061682	0.4490	-0.40349
28	0.2512	0.0631	-1.9276	0.0864	0.7682	0.0540	0.04459	0.044365	0.045517	0.062047	0.2743	0.219622
30	0.1777	0.0644	-1.5823	0.0807	0.7450	0.0544	0.044369	0.044139	0.045362	0.063115	0.1761	1.616556
32	0.1529	0.0648	-1.3172	0.0763	0.7324	0.0546	0.044471	0.044328	0.045212	0.063812	-0.1936	2.980492
34	0.1143	0.0655	-0.8880	0.0692	0.6999	0.0552	0.044816	0.044821	0.045137	0.063986	-0.5082	-1.32597
36	0.0656	0.0663	-0.9890	0.0710	0.6940	0.0553	0.045356	0.045511	0.04535	0.064258	0.7033	-6.94234
38	0.0261	0.0670	-0.7564	0.0672	0.6808	0.0555	0.045545	0.045793	0.045433	0.064393	1.3102	5.43626
40	-0.0017	0.0675	-0.7290	0.0668	0.6499	0.0561	0.046087	0.046332	0.045987	0.066024	0.0141	7.384457
42	0.0006	0.0675	-1.6456	0.0821	0.6399	0.0562	0.046507	0.046651	0.046318	0.068166	-1.5930	-17.1087
44	0.0254	0.0670	-2.0951	0.0896	0.6134	0.0567	0.047053	0.047035	0.046575	0.069123	-9.7062	-42.4865
46	0.0262	0.0670	-1.9949	0.0878	0.6013	0.0569	0.047462	0.047282	0.046599	0.06885	2.4635	-48.4023
48	0.0434	0.0667	-1.5083	0.0798	0.5909	0.0571	0.047748	0.047471	0.046623	0.071235	27.6848	38.21163
50	0.0808	0.0661	-1.9325	0.0868	0.5837	0.0572	0.047718	0.047451	0.046577	0.074355	43.3645	136.2374
52	0.1107	0.0656	-5.5381	0.1468	0.5967	0.0570	0.047725	0.047575	0.046746	0.078553	13.9898	312.9661
54	0.1273	0.0653	-6.4514	0.1618	0.6157	0.0567	0.047743	0.047775	0.046937	0.082789	9.5420	-1138.23
56	0.1532	0.0648	-3.4989	0.1124	0.6205	0.0566	0.047758	0.047971	0.047035	0.087626	-91.9586	-4169.11
57	0.1525	0.0648	-3.0812	0.1054	0.6324	0.0564	0.047823	0.047997	0.047186	0.09259	-127.6087	-3031.97
58	0.1831	0.0643	-2.4444	0.0952	0.6292	0.0564	0.04792	0.048238	0.047239	0.095298	-280.6087	-1292.26
60	0.1768	0.0644	0.4612	0.0471	0.6486	0.0561	0.047785	0.048086	0.047237	0.097115	229.8138	3884.495
62	0.1937	0.0641	-0.6993	0.0668	0.6702	0.0557	0.048044	0.048206	0.047792	0.098444	543.6943	-8340.34
64	0.2070	0.0639	-6.4502	0.1630	0.6888	0.0554	0.047993	0.047942	0.048143	0.105044	123.2957	-65757
66	0.2195	0.0637	-0.8543	0.0698	0.6867	0.0554	0.048193	0.047933	0.048735	0.10805	-1959.26	-30209.1
68	0.2335	0.0634	5.6058	-0.0381	0.6664	0.0558	0.048182	0.047804	0.049033	0.104181	-5971.67	-105306
70	0.2304	0.0635	9.1811	-0.0968	0.6635	0.0558	0.048258	0.047905	0.049348	0.093054	-6610.10	
72	0.2371	0.0634	-14.8181	0.3038	0.6831	0.0555	0.048077	0.047895	0.049377	0.090691	6571.85	
74	0.2359	0.0634	-88.3657	1.5285	0.6892	0.0554	0.047525	0.047604	0.049003	0.082783	30562.84	
76	0.2367	0.0634	-132.20	2.2575	0.6992	0.0552	0.047261	0.047593	0.048836	0.058101	63014.34	
78	0.2762	0.0627	-146.56	2.4933	0.6893	0.0554	0.047081	0.047557	0.048639	0.041598	242575.1	
80	0.3171	0.0620	-109.12	1.8679	0.6856	0.0555	0.047198	0.047639	0.048651	0.021409		
82	0.3388	0.0616	33.19	-0.5057	0.7191	0.0549	0.04761	0.047829	0.048906	0.02054		
84	0.3457	0.0615	351.03	-5.8007	0.7380	0.0545	0.047526	0.047403	0.048589	0.010513		
86	0.3458	0.0615	879.62	-14.6048	0.7348	0.0546	0.047453	0.046992	0.048108	-0.03085		
88	0.3658	0.0611	1481.06	-24.6111	0.7425	0.0545	0.047526	0.046869	0.047531	-0.05789		
90	0.3964	0.0606	1905.47	-31.6667	0.7246	0.0548	0.048107	0.047498	0.047299	-0.04586		
92	0.4495	0.0597	4365.72	-72.6497	0.7007	0.0552	0.048119	0.047826	0.046543	0.037925		
94	0.4521	0.0596	7343.06	-122.21	0.6878	0.0554	0.048212	0.048426	0.046073	0.08014		
95	0.4910	0.0589	7592.95	-209.09	0.6897	0.0554	0.048105	0.048443	0.046232	0.13453		
96	0.4846	0.0591	13091.09	-217.95	0.7389	0.0545	0.04817	0.048913	0.04559	0.189292		
98	0.5047	0.0587	20231.62	-336.89	0.7703	0.0540	0.049039	0.050123	0.045845	0.413252		
100	0.4728	0.0593	33550.93	-558.74	0.8047	0.0534	0.049634	0.050676	0.045414	0.550475		
102	0.5526	0.0579	55705.20	-927.67	0.8562	0.0525	0.049701	0.050208	0.044177	0.761883		
104	0.5529	0.0579	26698.26	-444.15	0.8761	0.0521	0.051666	0.051162	0.045108	0.38497		

106	0.5320	0.0582	-1281541.2	21357.4	0.8156	0.0532	0.053308	0.051469	0.046607	1.763681
108	0.5704	0.0576			0.7878	0.0537	0.051419	0.048184	0.045641	4.348166
110	0.7073	0.0552			0.7343	0.0546	0.051664	0.047272	0.047364	-2.82745
112	1.0665	0.0489			0.8799	0.0521	0.04967	0.044622	0.046471	

Table C3. F-parameters K(e)SV and beta(e)SV, computed for the MLF made Sorted Variations in Quran of the specified Arabic names

J	β-محمد	β-احمد	β -عیسی	β-مسیح	β-مریم	K-موسی	β-موسی	β-ابراهیم	β-نوح	β-حسن	β-مهدی
0	0.042489	0.042193	0.046586	0.041447	0.045628	0.669584	0.043221	0.048222	0.037898	0.04136	0.044115
2	0.047112	0.046825	0.053758	0.04481	0.050839	0.304102	0.049577	0.054009	0.040026	0.044776	0.053294
4	0.050969	0.050946	0.05447	0.046875	0.052137	0.261941	0.050311	0.054847	0.041757	0.046969	0.05784
6	0.054799	0.055115	0.055983	0.049138	0.055014	0.132526	0.052561	0.057394	0.043448	0.049254	0.057441
8	0.054378	0.055054	0.055933	0.050063	0.056478	0.091758	0.05327	0.058477	0.043831	0.050068	0.055592
10	0.053908	0.054554	0.056455	0.051009	0.057462	0.026173	0.054411	0.059412	0.044231	0.050893	0.053632
12	0.05468	0.054739	0.055905	0.051327	0.057313	-0.02537	0.055307	0.059807	0.044396	0.051214	0.051838
14	0.055507	0.055037	0.053487	0.051334	0.056417	-0.0097	0.055035	0.059546	0.044597	0.051348	0.050301
16	0.054392	0.053767	0.052004	0.051527	0.056491	0.005671	0.054767	0.059945	0.04483	0.051655	0.051154
18	0.054121	0.053396	0.053717	0.051451	0.056951	-0.0084	0.055012	0.060083	0.044994	0.051557	0.051625
19	0.053633	0.052819	0.053845	0.05165	0.057011	-0.02573	0.055314	0.059968	0.044609	0.051621	0.051648
20	0.053131	0.052558	0.054929	0.05161	0.057572	-0.02154	0.055241	0.060405	0.044655	0.05158	0.050548
22	0.052854	0.052958	0.054969	0.052034	0.057644	-0.03302	0.05544	0.060695	0.044336	0.051897	0.049289
24	0.052669	0.053204	0.054969	0.05221	0.057642	-0.02408	0.055285	0.061125	0.04436	0.052111	0.055379
26	0.051436	0.051838	0.056212	0.051863	0.058525	-0.02899	0.05537	0.061003	0.044253	0.051908	0.067103
28	0.051353	0.052043	0.057624	0.051586	0.059036	-0.01894	0.055195	0.06095	0.044281	0.05173	0.077834
30	0.055526	0.056812	0.060571	0.051488	0.059355	-0.0137	0.055104	0.060915	0.044124	0.05158	0.085419
32	0.056539	0.057454	0.061866	0.051199	0.059474	-0.00864	0.055016	0.061107	0.044348	0.051139	0.077468
34	0.060011	0.059983	0.062114	0.050848	0.060005	0.036748	0.054227	0.061392	0.044895	0.050696	0.070211
36	0.064765	0.063979	0.062416	0.051033	0.060779	0.078358	0.053503	0.06138	0.045678	0.050949	0.059933
38	0.069767	0.0673	0.059746	0.051288	0.06139	0.090733	0.053288	0.061581	0.046016	0.051363	0.051067
40	0.075201	0.070822	0.055587	0.051577	0.062198	0.099956	0.053128	0.061656	0.046475	0.051737	0.050598
42	0.08145	0.078376	0.053652	0.051496	0.062674	0.096871	0.053181	0.061299	0.046567	0.051573	0.06137
44	0.085828	0.087124	0.052624	0.051851	0.063204	0.081351	0.053451	0.060672	0.046721	0.051758	0.069544
46	0.083143	0.088361	0.052876	0.052248	0.063692	0.080783	0.053461	0.060201	0.046918	0.052078	0.104667
48	0.077345	0.08557	0.056151	0.052573	0.063973	0.084995	0.053388	0.059916	0.047305	0.052505	0.134213
50	0.071915	0.081116	0.059903	0.052499	0.064349	0.065659	0.053724	0.059961	0.047602	0.05261	0.149715
52	0.065773	0.068466	0.062075	0.05221	0.064895	0.029061	0.054361	0.059735	0.047935	0.052389	0.155561
54	0.075187	0.065442	0.065279	0.052463	0.065577	0.023106	0.054464	0.059864	0.048102	0.05252	0.165121
56	0.072141	0.054866	0.071557	0.052835	0.066083	0.019895	0.05452	0.06045	0.048081	0.052702	0.12685
57	0.072177	0.054015	0.067749	0.053086	0.066275	0.011483	0.054666	0.060283	0.048036	0.05272	0.122291
58	0.069721	0.05337	0.069074	0.053241	0.066515	-0.00452	0.054945	0.060507	0.048129	0.05305	0.080215
60	0.064805	0.054967	0.065912	0.053753	0.06713	0.00053	0.054857	0.060679	0.047887	0.053707	0.077167
62	0.061177	0.067922	0.070972	0.054113	0.067564	-0.00612	0.054972	0.06128	0.048027	0.054271	-0.01442
64	0.03831	0.067906	0.071289	0.054586	0.067665	-0.0472	0.055687	0.061619	0.047793	0.054789	-0.02013
66	0.027381	0.063115	0.071076	0.05533	0.067823	-0.11229	0.056819	0.061695	0.047791	0.055362	0.052495
68	0.012966	0.03193	0.074118	0.055905	0.067301	-0.14889	0.057455	0.061744	0.047721	0.055718	0.260715
70	0.00962	0.00863	0.066124	0.05616	0.066744	-0.17518	0.057913	0.061817	0.048016	0.05594	0.307547
72	0.027242	0.003585	0.064913	0.055869	0.066559	-0.17357	0.057885	0.062143	0.048268	0.055855	0.065715
74	0.069346	0.014525	0.069128	0.05585	0.066719	-0.18787	0.058133	0.062391	0.048091	0.056076	0.349377
76	0.148271	0.090041	0.076312	0.055383	0.066694	-0.1924	0.058212	0.062553	0.047864	0.055624	0.703736
78	0.141497	0.121577	0.096207	0.055202	0.066634	-0.16992	0.057821	0.063184	0.047342	0.055193	0.659076
80	0.195197	0.195235	0.114929	0.055293	0.066882	-0.16078	0.057662	0.063809	0.046992	0.055017	0.287964
82	0.275459	0.275187	0.135548	0.05517	0.067138	-0.15542	0.057569	0.064467	0.047146	0.054901	-1.23784
84	0.412145	0.479268	0.149582	0.054548	0.067584	-0.13911	0.057285	0.065042	0.047144	0.054588	-4.81214
86	0.427743	0.596448	0.150099	0.05437	0.067892	-0.11526	0.056871	0.065153	0.047322	0.054717	-14.144
88	0.665048	0.871199	0.138851	0.053684	0.068279	-0.09815	0.056573	0.0662	0.047545	0.053993	-31.1958

90	0.76863	1.069652	0.092361	0.052761	0.069029	-0.06677	0.056027	0.067421	0.048089	0.052675	-51.4415
92	0.796287	1.22336	0.056239	0.051973	0.06966	-0.05611	0.055842	0.068112	0.048064	0.051517	-67.5805
94	1.00225	0.905579	-0.06024	0.051274	0.070431	-0.06532	0.056002	0.068839	0.04835	0.050901	-21.3437
95	1.563159	0.760586	-0.02514	0.051332	0.07023	-0.07086	0.056378	0.068604	0.048393	0.050557	-15.1037
96	2.25699	0.533608	-0.22024	0.050522	0.07071	-0.09328	0.056488	0.069379	0.048681	0.050686	65.98499
98	3.371894	-0.57633	-0.26268	0.049358	0.070781	-0.0597	0.055904	0.069744	0.049728	0.050005	363.1232
100	6.181763	-1.28642	-0.08231	0.048476	0.071595	0.019348	0.05453	0.069846	0.049936	0.048971	720.0928
102	6.40337	-8.71358	-0.06546	0.049703	0.072595	0.103926	0.053059	0.070465	0.049129	0.049379	862.6707
104	5.993223	-18.6487	0.058043	0.050237	0.072484	0.164919	0.051998	0.070695	0.050378	0.049149	1930.723
106	7.376233	-13.3393	-1.05723	0.050646	0.072149	0.216994	0.051092	0.069296	0.05225	0.049824	5484.03
108	19.04969	33.90756	-6.50437	0.049405	0.072371	0.289985	0.049823	0.066241	0.051805	0.050268	
110			-13.7035	0.048661	0.070391	0.18482	0.051652	0.063872	0.054096	0.051944	
112				0.048289	0.068436	0.086072	0.053369	0.068129	0.053584	0.053336	

Table C4. F-parameter K(e)SV and beta(e)SV, computed for the MLF made Sorted Variations in Quran of the specified non-Arabic names

J	K-JamesClerk	β-JamesClerk	K-Erwin	β-Erwin	K-Werner	β-Werner	β-Max	β-Albert	β-Stephen	β-Edward	β-Baback β-بابک
0	-0.8152	0.0447	1.2858	0.0446	0.8194	0.0419	0.0455	0.0483	0.0475	0.0436	0.047458
2	-1.1569	0.0492	0.9258	0.0509	0.4987	0.0475	0.0535	0.0553	0.0548	0.0477	0.055162
4	-1.5869	0.0558	0.9526	0.0504	0.4389	0.0486	0.0551	0.0561	0.0542	0.0526	0.057065
6	-0.8159	0.0446	0.8999	0.0514	0.3507	0.0501	0.0572	0.0576	0.0552	0.0543	0.057315
8	0.0117	0.0333	0.8758	0.0518	0.3246	0.0505	0.0568	0.0596	0.0550	0.0594	0.055937
10	-1.8256	0.0618	0.8130	0.0529	0.2895	0.0512	0.0579	0.0627	0.0553	0.0579	0.055082
12	-4.3204	0.0990	0.7899	0.0533	0.2705	0.0515	0.0593	0.0638	0.0554	0.0559	0.05597
14	-10.4666	0.1892	0.8023	0.0530	0.2360	0.0521	0.0572	0.0634	0.0540	0.0563	0.054891
16	-6.8904	0.1349	0.7883	0.0533	0.2008	0.0527	0.0551	0.0629	0.0529	0.0522	0.053675
18	-4.5903	0.1041	0.7879	0.0533	0.1906	0.0529	0.0559	0.0635	0.0534	0.0471	0.054091
19	11.0227	0.3624	0.7872	0.0533	0.1900	0.0533	0.0566	0.0638	0.0545	0.0308	0.056835
20	-7.4367	0.1525	0.7647	0.0537	0.1634	0.0533	0.0561	0.0642	0.0537	0.0367	0.057687
22	-30.62	0.5004	0.7674	0.0537	0.1474	0.0536	0.0546	0.0631	0.0543	0.0450	0.061896
24	-75.66	1.1725	0.7532	0.0539	0.1133	0.0542	0.0529	0.0607	0.0565	0.0647	0.062578
26	-110.95	1.7086	0.7624	0.0537	0.0849	0.0547	0.0541	0.0588	0.0599	0.1149	0.062787
28	-356.33	5.3645	0.7500	0.0540	0.0263	0.0557	0.0552	0.0583	0.0611	0.1534	0.065718
30	-91.75	1.3945	0.7298	0.0543	0.0036	0.0561	0.0582	0.0585	0.0611	0.1577	0.073489
32	403.80	-5.9402	0.7129	0.0546	-0.0194	0.0565	0.0603	0.0587	0.0594	0.1471	0.078791
34	364.82	-5.2011	0.6878	0.0550	-0.0495	0.0570	0.0638	0.0592	0.0576	0.1520	0.069491
36	-1692.52	25.54	0.6896	0.0550	-0.0410	0.0569	0.0700	0.0594	0.0577	0.2029	0.065412
38	-2896.37	43.33	0.6901	0.0550	-0.0330	0.0568	0.0718	0.0601	0.0567	0.1470	0.059817
40	-13748.8	204.87	0.6771	0.0552	-0.0320	0.0567	0.0700	0.0603	0.0555	0.0276	0.065454
42	-16636.6	247.65	0.6880	0.0550	-0.0344	0.0568	0.0681	0.0607	0.0552	-0.0379	0.082646
44	43021.4	-640.17	0.6972	0.0549	-0.0508	0.0571	0.0650	0.0620	0.0556	-0.2259	0.091927
46	35842.1	-525.64	0.7197	0.0545	-0.0474	0.0570	0.0582	0.0633	0.0575	-0.4403	0.09775
48	-115619.3	1736.0	0.7333	0.0542	-0.0487	0.0570	0.0543	0.0649	0.0615	-0.3463	0.098497
50	-331067.1	4937.3	0.7272	0.0544	-0.0626	0.0573	0.0565	0.0673	0.0653	0.1780	0.097495
52	-463269.3	6880.0	0.7126	0.0546	-0.0636	0.0573	0.0580	0.0686	0.0652	1.0133	0.08738
54	546251.7	-8202.8	0.7016	0.0548	-0.0587	0.0572	0.0576	0.0700	0.0629	0.8758	0.058442
56	3213365.6	-47880.5	0.6756	0.0553	-0.0648	0.0573	0.0648	0.0708	0.0634	0.6454	0.0472
57	3679066.4	-54712.8	0.6630	0.0555	-0.0581	0.0572	0.0562	0.0708	0.0621	0.0521	0.037508
58	3342066.8	-49680.0	0.6666	0.0554	-0.0519	0.0571	0.0557	0.0706	0.0620	0.9910	0.056388
60	714893.1	-10178.2	0.6697	0.0554	-0.0253	0.0566	0.0615	0.0725	0.0598	1.4388	0.069546
62			0.6668	0.0554	-0.0036	0.0562	0.0911	0.0735	0.0618	3.8535	0.092621
64			0.6666	0.0554	0.0135	0.0560	0.1183	0.0735	0.0639	3.7620	0.120966
66			0.6497	0.0557	0.0378	0.0555	0.1354	0.0742	0.0698	0.1653	0.104427
68			0.6287	0.0561	0.0611	0.0551	0.1492	0.0743	0.0803	-3.2955	0.168102

70	0.6284	0.0561	0.0774	0.0548	0.1739	0.0738	0.0866	-23.0085	0.239576
72	0.6309	0.0560	0.0950	0.0545	0.2131	0.0716	0.0830	-66.4004	0.271827
74	0.6182	0.0562	0.1033	0.0544	0.2326	0.0690	0.0902	-68.9758	0.110903
76	0.6037	0.0565	0.1103	0.0543	0.2698	0.0664	0.1044	-100.237	-0.14072
78	0.5924	0.0567	0.1134	0.0542	0.1884	0.0653	0.1168	-101.705	-0.15988
80	0.5983	0.0566	0.1251	0.0540	0.0368	0.0650	0.1009	-233.06	-0.24295
82	0.6179	0.0563	0.1318	0.0539	-0.0454	0.0647	0.0807	-477.793	-0.47241
84	0.5928	0.0567	0.1503	0.0536	-0.1398	0.0640	0.0593	-1017.52	-0.67307
86	0.5093	0.0581	0.2006	0.0527	-0.1786	0.0606	0.0255	-1005.63	-0.31922
88	0.4452	0.0593	0.2424	0.0520	-0.0938	0.0592	0.0429	988.8535	2.374326
90	0.4065	0.0599	0.2441	0.0519	-0.2566	0.0605	0.0760	722.53	8.096312
92	0.3896	0.0602	0.2330	0.0521	-0.2943	0.0649	0.1408	798.7046	11.42949
94	0.4042	0.0600	0.2094	0.0525	-0.6460	0.0705	0.2225	36918.33	11.07441
95	0.4059	0.0599	0.2071	0.0526	-0.9903	0.0716	0.2275	91787.55	9.595219
96	0.4325	0.0595	0.2454	0.0519	-1.4595	0.0671	0.2699	81033.74	8.86529
98	0.4044	0.0600	0.3067	0.0509	-2.2415	0.0625	0.3187		0.816196
100	0.3726	0.0605	0.2814	0.0513	-3.9365	0.0689	0.3793		13.13211
102	0.3781	0.0604	0.2392	0.0520	-5.1425	0.0926	0.3530		106.5497
104	0.4016	0.0600	0.1828	0.0530	-5.4864	0.1057	1.4857		399.3597
106	0.3463	0.0610	0.0267	0.0557	-5.8514	0.0613	3.0878		264.135
108	0.2945	0.0619	-0.1174	0.0582	9.3092	-0.1180	6.7104		-711.476
110	0.2188	0.0632	-0.2049	0.0598	119.3	-0.1448	10.87		
112	0.2534	0.0626	-0.0943	0.0578					

Appendix D

Example of a QGCC Generation From its CF-plot: QGCC of the Name "Ahmad" with B=e

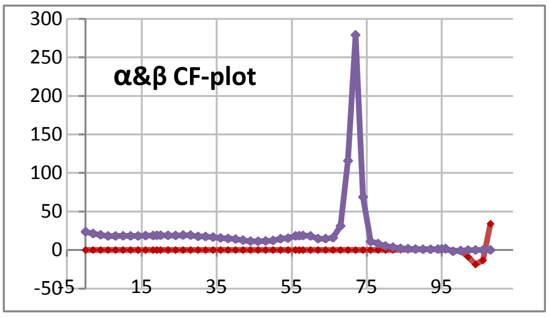
Corresponding Js and beta(J)s are first copied from Table C3 (seen as first and second left columns in Table D1) and along with alpha (=1/beta, seen as fourth column in TableD1) will be pasted in the Excel sheet. Next, simultaneous CF/DF-plots of alpha&beta will be made using the following plot options in Excel 2007 (or its higher versions)**: Insert → Scatter → Scatter with straight lines**, and then in order to make the final QGCC:

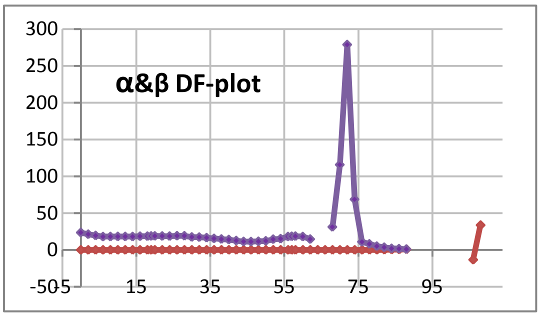
Format Data series → Line Style: Cap type: Square, Join type: Bevel, Width: adjust the Line Width until the Calligraphic Output (QGCC) visually looks optimized.

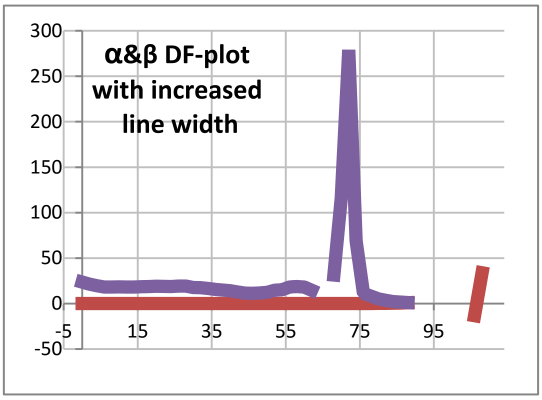
Table D1. F-parameters computed for the name Ahmad (see β-احمد in Table C3)

J	β(e)SV- احمد Continuous Form	β(e)SV- احمد Discrete Form (DF)	α(e)SV-احمد Continuous Form	α(e)SV-احمد Discrete Form (DF)
0	0.042193	0.042193	23.70069	23.70069
2	0.046825	0.046825	21.35612	21.35612
4	0.050946	0.050946	19.62873	19.62873
6	0.055115	0.055115	18.14386	18.14386
8	0.055054	0.055054	18.16393	18.16393
10	0.054554	0.054554	18.33057	18.33057
12	0.054739	0.054739	18.26846	18.26846
14	0.055037	0.055037	18.16945	18.16945
16	0.053767	0.053767	18.59867	18.59867
18	0.053396	0.053396	18.7279	18.7279
19	0.052819	0.052819	18.93269	18.93269
20	0.052558	0.052558	19.02656	19.02656
22	0.052958	0.052958	18.88286	18.88286
24	0.053204	0.053204	18.79547	18.79547
26	0.051838	0.051838	19.29073	19.29073
28	0.052043	0.052043	19.21488	19.21488
30	0.056812	0.056812	17.60194	17.60194

32	0.057454	0.057454	17.40515	17.40515
34	0.059983	0.059983	16.67135	16.67135
36	0.063979	0.063979	15.63003	15.63003
38	0.0673	0.0673	14.85877	14.85877
40	0.070822	0.070822	14.11983	14.11983
42	0.078376	0.078376	12.75907	12.75907
44	0.087124	0.087124	11.47785	11.47785
46	0.088361	0.088361	11.31727	11.31727
48	0.08557	0.08557	11.68635	11.68635
50	0.081116	0.081116	12.32797	12.32797
52	0.068466	0.068466	14.60574	14.60574
54	0.065442	0.065442	15.28066	15.28066
56	0.054866	0.054866	18.22615	18.22615
57	0.054015	0.054015	18.51349	18.51349
58	0.05337	0.05337	18.73698	18.73698
60	0.054967	0.054967	18.19283	18.19283
62	0.067922	0.067922	14.72271	14.72271
64	0.067906	0.067906	14.72616	
66	0.063115	0.063115	15.84397	
68	0.03193	0.03193	31.31877	31.31877
70	0.00863	0.00863	115.8805	115.8805
72	0.003585	0.003585	278.9258	278.9258
74	0.014525	0.014525	68.84543	68.84543
76	0.090041	0.090041	11.1061	11.1061
78	0.121577	0.121577	8.225273	8.225273
80	0.195235	0.195235	5.12204	5.12204
82	0.275187	0.275187	3.633888	3.633888
84	0.479268	0.479268	2.086515	2.086515
86	0.596448	0.596448	1.676593	1.676593
88	0.871199	0.871199	1.147844	1.147844
90	1.069652		0.934884	
92	1.22336		0.817421	
94	0.905579		1.104266	
95	0.760586		1.314775	
96	0.533608		1.874035	
98	-0.57633		-1.73512	
100	-1.28642		-0.77735	
102	-8.71358		-0.11476	
104	-18.6487		-0.05362	
106	-13.3393	-13.3393	-0.07497	
108	33.90756	33.90756	0.029492	







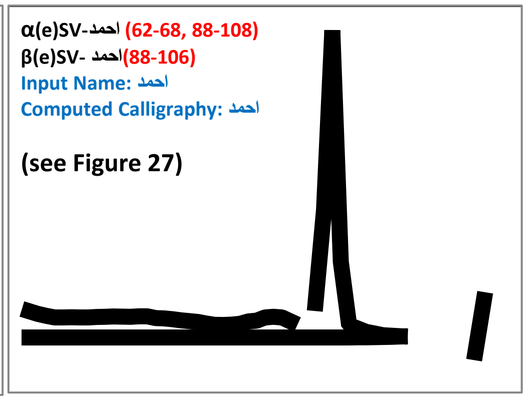


Table D1 shows alpha and beta computed in base e for the name Ahmad "احمد" used for its CF/DF-plots. Omission of the segments from the CF-plot is done simply by erasing selected data points in CF columns for both alpha and beta. Figures, from left to right and from top to the bottom, show typical consecutive steps for making a Quran Generated Computed Calligraphy starting from the original CF-plot to the final QGCC.

Copyrights