Decimal Digit Sums up to 11 are Clustered in Physical Constants

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Abstract - *Fine-Structure Constants not only contain the important number 137, but their 137s also act as Decimal Digit Sums 1+3+7=11. These Decimal Digit Sums 11 occur extensively in the first parts of Physical Constants such as Inverse Fine-Structure Constant, Euler's Constant, Pi , Phi, and the Square Root of 2. The possible reasons for this are dicussed.*

Keywords - *Physical Constants, Fine-Structure Constant, 137, Square Root of Two, Euler's Constant, Pi, Phi.*

I. INTRODUCTION

The commonly used expression in physics literature for the fine-structure constant alpha (α) is $\alpha = e^2/\hbar c$, where e is the elementary charge, $\hbar$ is the reduced Planck constant, and c is the speed of light in vacuum. Since the early 1900s, physicists have suspected that the number 137 in the inverse fine-strcuture constant $1/\alpha$ = 137.035 999 … would lay at the heart of a

grand unified theory, relating theories of electromagnetism, quantum mechanics and gravity. Some years ago it was proposed [1] that the 137 should be read as 11 squared plus 4 squared, and that these numbers 11 and 4 related respectively to the 11 dimensions of M-Theory and the 4 dimensions of Einstein's space-time [1]. Added to this was the suggestion that the 035 triplet in $1/\alpha$ = 137.035, by standing for 0.035 meant a 3.5 precent visible universe, thereby indicating 96.5 precent dark energy and dark matter [2]. To summarize therefore, $1/\alpha = 11^2 + 4^2 + 0.035 = 121 + 16 + 0.035 = 137.035$ … It was also proposed that $1/\alpha = 137.035999…$ was encrypted into a numerical code 137 035 999…, and that functional domains of this code were separated from each other by 999 triplets [3].

II. POSSIBLE UNIVERSES

The universe we live in has an inverse fine-structure constant of 137.035999…
which is about 137, so it might be that other unverses only exist if their inverse
fine-structure constants are Pythagorean primes as well, *i.e* if they possess $1/\alpha$ values of about 5, 13, 17, 29,…, 137… etc.

III. CODATA AND QHE

The fine-structure constant was generally measured by the CODATA Task Group on Fundamental Constants [4] and somewhat later [5] by a new and wholly different measurerement approach using the Quantum Hall effect (QHE). Both CODATA and QHE tests give the same $1/\alpha$ = 137.035999… as a result but they generally vary after the 999... This suggests that 999 acts as a 'stop codon' which has the ability to limit the $1/\alpha$ activity to 137.035.

IV. RIGHT TRIANGLE

That $137 = 11^2 + 4^2$ suggests the possibility of a right triangle formed by the frontal part of $1/\alpha$ with respective sides x = 11, y = 4, and z= $\sqrt{137}$ = 11.7046999… Here the 999 triplet in the z-side of the triangle would allow 117 046 to be expressed, but not the 999 triplets or the triplets after the 999 triplet.

V. DECIMAL DIGITS

It seems likely that codes 137 035 and 117 046 are involved In the fine-strcture splitting of atomic spectral lines. Interestingly, the Decimal Digit Sum 1+3+7+3+5 equals 19, and also 1+1+7+0+4+6 equals 19. It is therefore likely that decimal sums play a role in the fine-structure mechanism.

In the inverse Fine-Structure Constant the leading triplet 137 has a Digital Sum 1+3+7 = 11. For this reason, Digital Sums of 11 were searched for in different physical constants, *i.e.* in the inverse Fine Structure Constant ($1/\alpha$), the Square Root of Two ($\sqrt{2}$) , Euler's Constant "*e*", Pi (π), and Phi (φ). Results were as follows: Decimal Digits 11 were found at the beginning of the Inversed Fine -Structure Constant ($1/\alpha$), the Square Root of Two, Euler's Constant, Pi (π) and Phi(φ). In the following list of pysical constants the digital 'elevens' are in black and are shown between brackets: $1/\alpha$ = {***137***) 035999… , $\sqrt{2}$ = 1.4(***14213***)56 …, e= 2.7 (***182***) 8 (***182***) 84…, φ= 1.61(***803***)398… , π = 3.(***1415***)(***92***)(***65***)358 …

VI. DISCUSSION

The famous physicist Richard Feynman referred to the number 137 of the reverse Fine-Structure Constant $1/\alpha$ as follows: ''…It has been a mystery ever since it was discovered more than fifty years ago, and all good theoretical physcists should put this number up on their wall and worry about it. Immediately you would like to know where this number for a coupling comes from. Is it

related to number Pi(π) or perhaps tot he base of natural logarithms? Nobody knows. It's one of

the greatest mysteries of physics, a magic number that comes to us with no understanding by man…" [6].

Turning to the present work on the inverse Fine-Structure constant [1-3], the 137 stands not only for 121 + 16 = 137, , but also for 1+3+7 = 11. Physical constants are filled with Decimal Digit Sums from Fine-Structure Constants…. Feynman would perhaps call this all together a magic world!

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