Thue-Morse constant approximants' involvement in scaling the muon – electron g-factor ratio?

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Abstract
While making some progress in improvement of former approximation formulas' quality of fit by use of the Thue-Morse constant's approximants (see the file sciencephilosophy10.pdf of our http://culetto.at/private_research_associates/ …website), approximations to the numerical value of the *muon – electron g-factor ratio* were found too. We aren't saying that there really is a causal connection. Nevertheless, the find (if such) would be another puzzle-piece in the pattern of Mandelbrot set M's likely possible role in giving to (relative) constants of nature the values they happen to have.

A far-reaching influence of the parity constant?

Starting from the NIST/CODATA 2010 values for the electron and muon g-factors g_e and g_μ, the g_μ/g_e ratio was calculated and is 1.000 006 261 45(65), its accuracy limited by the muon g-factor's standard uncertainty of 1.3×10^{-9}. By Mandelbrot set's main bifurcation series roots' external angles from Hubbard/Douady's external angle/ray method the said g-factor ratio can be approximated by the relation

$$\ln\left(\frac{g_\mu}{g_e}\right) \approx \frac{\xi(c_4)}{\xi(c_D)} \ln\left(\frac{\xi(c_D)}{\xi(c_{16})}\right) , \qquad \text{Eq.(1)}$$

where the $\xi(c_k)$, $k=2^n$, are the upper external angles belonging to the roots of the 2nd, the 4th and the infinite bifurcation of the main series on M's real c-axis, c_D being the Myrberg-Feigenbaum point's coordinate. As the upper external angles used are known to converge to the Thue-Morse (also called parity) constant P (= 0.412 454…), the n=2 and 4 bifurcation external angles 2/5 and 106/257 may be seen as its P_2 and P_4 approximants, respectively. The fit value for the log of the g-ratio, gotten from Eq.(1), is 0.000 006 282 170… compared with 0.000 006 261 430… calculated from the NIST/CODATA g-factor values. If one felt that the log's pre-factor be a too constructed one, the much simpler expression

$$g_\mu P_4 \approx g_e P \qquad \text{Eq.(2)}$$

still would give an acceptable approximation (to 0.22ppm) to the g-factor ratio calculated from the NIST/CODATA recommended data.

Conclusion

Making use of the n=4 approximant to P instead of P itself (i.e. stopping at the 4th bifurcation of M's main series) did significantly enhance the precision of fit in case of the proton – electron rest mass ratio approximation (see our pdf sciencephilosophy5 and 10). That P_4 again appears in a leptons' g-factor-ratio approximation could well be some sign of the parity constant's (and thus of digital properties') significance on the smallest-scale level.