A Quantum Coupling Conjecture

by

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Abstract

Following the successful prediction of an *exact* value for the fine structure constant later confirmed to differ numerically from the centre value of the latest experimental recommended CODATA range by 10^{-12}, further analysis and predictions of *exact* values for two other quantum coupling constants, the strong and the electroweak, are given. The method employed to obtain these theoretical values depends on the conjecture that *all* measured values of quantum coupling constants approximate to *exact* values that can be found in a specific set of numerical values denoted by C_Q which has a countable infinite number of elements. The letter C and its subscript Q stand for coupling and quantum respectively.

$$C_Q = \{\Box(n_1,n_2) : n_1,n_2 \text{ integers}\},$$

where the numerical elements $\Box(n_1,n_2)$ are given by

$$\Box(n_1,n_2) = \Box(n_1,n_2) = n_2\cos(\Box/n_1)\tan(\Box(n_1\times n_2))/\Box$$

together with elements of the form

$$\Box(n_1,n_2) = (\Box(n_1,n_2) + \Box(n_1 \pm 1,n_2))/2 .$$

The inclusion of the arithmetic mean values is to take into account measurements that take place on an energy boundary between two possible consecutive theoretical values given by the function $\Box(n_1,n_2)$ and so are unable to discriminate between them. Questions of how this conjecture might be validated from the theoretical and measurement point of view and the identification of those elements having a definite physical significance constitute the subject matter of this paper.