Review of: "The Standard Model Symmetry and Qubit Entanglement"

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This article gives a concise and clear summary of two major developments in the description of gravity and the elementary particle interactions. The derivation of the equation of general relativity from thermodynamical principles and computation of entanglement entropy of qubits with corrections to the area law representing the contribution of matter fields, together with the subgroups of isometry groups of Bloch spheres coincidng with the standard model gauge groups, reflect a fundamental
interpretation of fermions in terms of qubits. Since the quarks and leptons have spin-1/2, the formulation in terms of qubits is consistent. The absence of a distinction between quarks and leptons in the qubit formalism does not prevent the occurrence of the gauge groups of the electroweak and standard models. It is sufficient to consider three-qubit configurations to have the gauge group SU(3)xSU(2)xU(1)/Z_6, which follows from isospin of the quarks. Two-qubit systems have the symmetry group SU(2)xU(1)/Z_2. The phenomenological consequences of the discrete factors have yet to be specified. The differences between the masses of the leptons and quarks is indicative of a different geometry of the two-qubit and three-qubit systsms. The SU(2) group in the electroweak theory has left-handed fermion doublet representations and right-handed singlet
representations. Therfore, it is not necessarily sufficient to start generating mass for the
sector transforming under SU(3)xU(1). It is likely that the subset of quaternion components of a six-dimensional vector, yielding the mass, would be required for the electron, according to the method described in this investigation. Furthermore, there is experimental evidence for the electron neutrino is have a non-zero mass. Techniques may developed for theoretically predicting the ratio of the electron to neutrino mass, which emanate from the division algebra structure of the spinor space of the standard model.