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Predictions in baryon and Higgs sectors from intrinsic quantum mechanics - on neutral pentaquarks and gauge boson couplings

I introduce an idea of intrinsic quantum mechanics where the gauge groups SU(3), SU(2) and U(1) share a common origin in an intrinsic U(3) configuration space for baryons. I present neutral pentaquark predictions in the baryon spectrum and I present Higgs to gauge boson couplings deviating by three percent in signal strengths from standard model predictions. The deviation originates in the appearance of the up-down quark mixing matrix element in the value for the electroweak energy scale determined from neutron decay. As the most recent result, I derive exemplar distributions for proton energy-momentum components showing a hollowness in the proton interior. The idea of intrinsic quantum mechanics is supported by derivations of u and d parton distribution functions for the proton; by a rather accurate value for the electron to neutron mass ratio 1/1839(1); by a theoretical suggestion for the value of the Cabibbo angle and by an equation for the Higgs mass in closed form yielding 125.095(14) GeV. The latter is an order of magnitude more accurate than the present average from combined ATLAS and CMS measurements. Higher statistics should settle the subtle differences between the standard model and intrinsic quantum mechanics predictions here put forward. A change in our conception of mass may ensue.

Main references:

EPL 102 (2013) 42002, EPL 124 (2018) 31001, EPL 125 (2019) 41001, EPL 128 (2019) 11004. See also arXiv 1710.09271 and book on ResearchGate (2018).

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