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A novel multiquark approach to hadron resonances

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A new scheme for the hadron spectroscopy is put forward. By assumption, the form of spectrum is dictated by the trace of energy momentum tensor in QCD. This provides the relativistic and renormalization invariance of hadron masses. The schema is applied to the light mesons. Two complementary interpretations of hadron states emerge. The first one represents an “atomic” structure of resonances, in which the quanta of non-perturbative gluon contributions are quantified via an effective formation of quasiparticles representing gluon analogues of positronium. This picture allows to build a “periodic table of hadronic elements”, i.e. to classify the hadron states, in some sense, in analogy with Mendeleev table in Chemistry. The Regge spin and radial trajectories appear in a natural way and without use of non-relativistic notion of orbital momentum or any semiclassical quantization conditions. The second interpretation is based on a “collisional” nature of some (or many) hadrons. This picture suits better for explaining the decay modes and isospin. In particular, it leads to a simple explanation of the scalar sector below 1˜GeV with correct masses and decay modes.

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