

A New Dynamical Picture for Production and Decay of the XYZ Mesons

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I introduce an entirely new dynamical description for tetraquark mesons, based upon the competing effects of the strong attraction between quarks in a diquark, and the inability of the diquark to hadronize on its own due to being a color nonsinglet. This mechanism naturally explains, for example, the strong preference of the $Z(4475)$ to decay to $\psi(2S)$ rather than the J/ψ , the existence of a state $Y(4630)$ that decays to Λ_c baryon pairs, and why some but not all exotics lie near hadronic thresholds. Owing to high-energy constituent counting rules, the four-quark nature of the states produces major changes to both the high- s scaling of cross sections for producing such states and to the potency of the cusp effect of attracting resonances to pair-production thresholds.

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