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Perturbative QCD Evidence for Spin-2 Particles in the Di-J/ψ Resonances

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We extend the nonrelativistic QCD framework to explore the nature of the newly discovered di-J/ψ resonances. Assuming them as either molecule-like states or tetraquarks, we calculated their hadroproduction cross sections at the LHC. We find that the observed resonances are most likely spin-2 particles, and there should exist their spin-0 counterparts near these resonances. The ratio of production cross sections of the observed resonances to the latent spin-0 ones are also presented, which might help to distinguish molecule-like states from tetraquarks.

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