

Application of the amplitude analysis method to the study of mass and angular spectra of heavy tetraquarks in di- J/ψ and J/ψ - $\psi(2S)$ decay channels

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The experimental discovery of resonant-like states in the di- J/ψ mass spectra in pp-collisions near the production threshold suggests the existence of fully-charmed tetraquarks (broad structure at 6600 MeV and narrow structures at 6900 and 7200 MeV). Numerous theoretical models following this discovery provide descriptions of the observed data, propose mechanisms underlying formation of this new states, and predict additional phenomena. Further investigations require precision experimental measurements. In this work, the amplitude analysis method is applied to describe mass and angular spectra of the observed signals in ATLAS experimental data simultaneously in J/ψ - J/ψ and J/ψ - $\psi(2S)$ decay channels. Mass and width of the resonances are measured accounting for interference effects between signals and background.
