Contribution ID: 207

Type: Oral

Hidden-charm strong decays of the charmonium-like states Y(4230) and X2(4014)

Wednesday 2 July 2025 12:10 (20 minutes)

We have investigated the hidden-charm strong decays of the exotic charmonium-like state Y(4230) [1] and the spin-2 partner X2(4014) of the charmonium-like state X(3872) [2], recently reported by the BES-III and BELLE collaborations. The exotic states Y and X2 have been interpreted as four-quark states with moleculartype interpolating currents in the framework of the covariant confined quark model. We evaluate the hiddencharm decay width of Y into a vector and a scalar, with the latter decaying subsequently to a pair of charged pseudoscalar states. The strong decay mode $Y \rightarrow \pi^+\pi^-$ has been studied by involving the both scalar resonances $f_0(500)$ and $f_0(980)$, considered quark-antiquark states, while the mode $Y \rightarrow K^+K^-$ - via $f_0(980)$. We have calculated the partial widths of the related strong decays and the branching ratio $B(Y \rightarrow K^+K^-)/B(Y \rightarrow \pi^+\pi^-)$, recently determined by the BES-III Collaboration. The estimated branching ratio and calculated partial strong decay widths are in reasonable agreement with the latest experimental data [1]. We have also considered the decay widths of X_2 on the level of two-petal quark loops. The partial widths of the strong decays $X_2 \rightarrow \omega J/\Psi$ and $X_2 \rightarrow \rho^0 J/\Psi$ have been calculated and the related branching ratio has been analyzed. In the comparison of our approach to the recent $D^* \bar{D}^*$ molecular scenario, we have shown the explicit appearance of the threshold effect in the latter models [2]. Our theoretical results might be checked by future experiments.

[1]. Gurjav Ganbold and M. A. Ivanov, Strong decays of charmonium-like state Y(4230), Eur. Phys. J. A {bf 60:13} (2024).

[2]. Gurjav Ganbold and M. A. Ivanov, Hidden-charm strong decays of the spin-2 partner of X(3872), Phys. Rev. D {\bf 111}, 014007 (2025).

Primary author: GANBOLD, Gurjav (Joint Institute for Nuclear Research, Dubna, Russia)

Presenter: GANBOLD, Gurjav (Joint Institute for Nuclear Research, Dubna, Russia)

Session Classification: 4. Relativistic nuclear physics, high-energy and elementary particle physics: Theory

Track Classification: Section 4. Relativistic nuclear physics, high-energy and elementary particle physics.