

WPCF 2023 - XVI Workshop on Particle Correlations and Femtoscopy & IV Resonance Workshop 2023



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Study of exotic f_0 and f_1 states with ALICE

Wednesday, 8 November 2023 14:30 (25 minutes)

Despite most of the known observed hadrons fit into the quark model picture formulated back in the 1960s', there exist several resonances whose properties suggest an exotic structure. In particular, the nature of $f_0(980)$, $f_1(1285)$, and $f_0(1710)$ states is still debated, as these have been proposed as ordinary two-quark states, compact tetraquarks, hadronic molecules, hybrid states or glueballs. Building on observables well known in the heavy-ion physics field, the nuclear modification factors in A–A and p–A collisions relative to pp collisions, as well as the elliptic flow coefficient, have been proposed as tools to investigate their internal structure.

In this contribution, the results on the production of $f_0(980)$ and $f_1(1285)$ states from the ALICE experiment at the LHC will be reviewed. These include the measurement of the production of $f_0(980)$ in pp and p–Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV as well as the first measurement of $f_1(1285)$ production in pp collisions at $\sqrt{s} = 13$ TeV. Results will be presented in comparison to models and in light of their sensitivity to the internal structure of these exotic states. Perspectives for measurements of $f_0(1710)$ will be discussed, motivated by the search for glueball states.

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