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$f_0(980)$ resonance production in pp collisions with the ALICE detector at LHC

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We report on a preliminary study of the production of $f_0(980) \rightarrow \pi^+ \pi^-$ at mid-rapidity ($|y| < 0.5$) performed with the ALICE detector at the LHC in minimum bias pp collisions at centre-of-mass energy $\sqrt{s} = 5.02$ TeV. The $f_0(980)$ signal extraction is challenging due to the large background from correlated $\pi^+ \pi^-$ pairs from resonance decays in the invariant mass window under study, as well as due to the combinatorics from uncorrelated pairs. We present in detail the strategy followed for the signal extraction and first results in terms of p_T -dependent production yields. Results are discussed and compared with production yields of other resonances and stable hadrons.

Short-lived hadronic resonances are a useful sampling tool for the late hadronic phase of ultra-relativistic heavy-ion collisions since their lifetimes are of the same order of magnitude as the time span between the chemical and kinetic freeze-out, typically estimated to be about 10 fm/c for central collisions. Our study in pp collisions provides a feasibility check and constitutes a reference for the measurement in high-multiplicity events (p-Pb, Pb-Pb).

The nature of the $f_0(980)$ remains elusive: different interpretation of this resonance including $q\bar{q}$ states, bound states of hadrons such as $K\bar{K}$, and as tetraquark candidate are available. Studies in different collision systems are particularly interesting because they can provide information about the nature of this particle.

Content type

Experiment

Collaboration

ALICE

Centralised submission by Collaboration

Presenter name already specified

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