

Strangeness in Quark Matter 2019



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Using $\Xi(1820)$ baryons to test for parity doubling at ALICE

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We investigate the production of $\Xi(1820)$ baryons in pp collisions at 13 TeV by reconstructing their Λ -K decays. Recent lattice calculations on parity doubling indicate that the masses of negative-parity particles, such as $\Xi(1820)$, may decrease at high temperatures, while the masses of positive-parity partners, i.e. the $\Xi(1530)$, do not. Furthermore, the lifetime of the $\Xi(1820)$ is short enough that it may be suppressed in high-multiplicity collisions, as has been observed for $\Lambda(1520)$, $K^*(892)$, and $\rho(770)$. Studying $\Xi(1820)$ also allows us to better understand the spectrum of excited hyperon states, with implications for our understanding of the hadron resonance gas. Using ALICE data from 2015-2018, we have reconstructed the $\Xi(1820)$ and measured its mass, width, and yield as functions of transverse momentum and collision multiplicity. The mass and width measurements are in general agreement with previous measurements, but could indicate a slight increase in the width as a function of charged particle multiplicity. These pp studies will inform future studies of the $\Xi(1820)$ in p-Pb and Pb-Pb collisions.

Collaboration name

ALICE Collaboration

Track

Hadron Resonances

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