

Production of Σ baryons in pPb and pp collisions at the LHC with ALICE

The strangeness production has been widely studied through measurements of kaons, Λ , Ξ and Ω baryons from small to large collision systems. However, a strange baryon has not been fully studied yet - the Σ baryon. Σ baryons contain a single strange quark and form a triplet, with the charge (+, 0, -) depending on the light quark content. However, the experimental measurement is a challenging task. Only Σ^0 in 7 TeV pp collisions have been measured by ALICE, while few other experiments have measured the charged states at lower pp(pp) collision energies.

During the LHC Run 2 several methods to identify charged Σ have been developed by ALICE. The decay $\Sigma^+ \rightarrow p + \pi^0$ can be reconstructed via the direct detection of the proton and the two gammas from the π^0 decay. Gamma can be also identified via conversion into e^+e^- pairs.

The latest addition is a method to detect anti-neutrons in the Photon Spectrometer (PHOS), allowing the $\bar{\Sigma}^\pm \rightarrow \bar{n} + \pi^\pm$ decays to be reconstructed. We present the transverse momentum spectra of Σ^+ and its charge conjugate anti-particle, in both minimum bias and high-multiplicity triggered pp collisions at $\sqrt{s} = 13$ TeV, $\bar{\Sigma}^\pm$ spectra in pPb and pp collisions at $\sqrt{s} = 5.02$ TeV and Σ^0 spectrum in 7 TeV pp collisions, compared with predictions from state-of-the-art Monte Carlo models. In addition, integrated yields are compared with Thermal model predictions.

Section

Heavy ion collisions at Intermediate and high energies

Primary author: GORDEEV, Pavel

Presenter: GORDEEV, Pavel

Session Classification: Poster session