

XXV International Baldin Seminar on High Energy Physics Problems
"Relativistic Nuclear Physics and Quantum Chromodynamics"



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on High Energy Physics Problems
Relativistic Nuclear Physics & Quantum Chromodynamics
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Σ hyperons production in pp and p-Pb collisions at LHC with ALICE

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In addition to Λ hyperon, new data on Σ hyperons production are compared to different Monte-Carlo models and contribute to the understanding of hadron production mechanisms.

The first measurements of the transverse momentum (p_T) spectra of Σ^0 and $\bar{\Sigma}^0$ hyperons in pp collisions at $\sqrt{s} = 7$ TeV at the LHC are presented. The $\Sigma^0(\bar{\Sigma}^0)$ is reconstructed via its electromagnetic decay channel $\Lambda(\bar{\Lambda}) + \gamma$, while the $\Lambda(\bar{\Lambda})$ baryon is detected via its decay into $p + \pi^-$ ($\bar{p} + \pi^+$). The low-energy photon is measured via conversion into e^+e^- pairs in the detector material and in PHOS calorimeter by exploiting the unique capability of the ALICE detector.

The complementary results on the first detection of Σ^+ and $\bar{\Sigma}^-$ hyperon at the LHC with ALICE are shown in pp collisions at $\sqrt{s} = 13$ TeV. The $\Sigma^+(\bar{\Sigma}^-)$ is reconstructed via its weak decay into $p(\bar{p}) + \pi^0$ with the challenging detection of low-energy photons from π^0 decay.

Also, the first reconstruction and p_T spectra of the production of $\Sigma^{\pm} \rightarrow \bar{n} + \pi^{\pm}$ in pp and p-Pb collisions are presented. Antineutron is identified and reconstructed with PHOS by unique signature of the annihilation process.

Primary author: Prof. BORISSOV, Alexander (MIPT)

Presenter: Prof. BORISSOV, Alexander (MIPT)

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