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System-size dependence of particle production at mid- and forward rapidity with ALICE

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The rapidity dependence of particle production contains information on the partonic structure of the projectile and target and is, in particular at LHC energies, sensitive to non-linear QCD evolution in the initial state. At LHC, collision final states have been mainly studied in the central kinematic region, however, there is a rich opportunity for measurements in the forward direction, which probe the nucleon structure at small Bjorken- x values. Moreover, investigating the system-size dependence of the particle production at the same collision energy is particularly important for directly studying nuclear effects.

In the first part of the talk, the final Run 1 and 2 particle-production results at forward rapidities will be presented for pp, p-Pb, and Pb-Pb collision systems, where ALICE has unique coverage. When combined, the Forward Multiplicity and the Silicon Pixel Detectors can measure charged particles over a wide range of $-3.4 < \eta < 5.0$. The Photon Multiplicity Detector has complementary coverage for neutral-particle production over the kinematic range $2.3 < \eta < 3.9$.

In the second part of the presentation, we will introduce the upgraded Run 3 ALICE configuration. The new Monolithic Active Pixel Sensors-based Inner Tracking System allows full tracking and vertexing for $|\eta| < 2.5$. When combined with the new Muon Forward Tracker, the tracking can be extended to cover $-3.6 < \eta < 2.5$. The performance of the new detectors and the tracking/matching algorithms will be presented for the $\sqrt{s} = 900$ GeV pp pilot-beam data taking in autumn 2021.

In-person participation

Yes

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