Measurement of charged-particle production in single diffractive proton-proton collisions with the STAR detector

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Abstract

We present results on the inclusive and identified (pion, kaon, proton and their antiparticles) charged-particle production in single diffractive dissociation process in proton-proton collisions at $\sqrt{s} = 200$ GeV with the STAR detector at RHIC. The forward-scattered proton is measured in the Roman Pot system, while the charged particle tracks are reconstructed in the STAR Time Projection Chamber (TPC). Ionization energy loss of charged particles in TPC is used for particle identification.

The proton-antiproton production asymmetry is measured as a function of transverse momentum (p_{T}) and invariant mass of diffractive system, and used to study the baryon number transfer over a large rapidity interval in single diffractive dissociation process. In addition, K/π ratio is measured, showing a larger strangeness production at $p_{\mathrm{T}} \gtrsim 0.5$ GeV/c compared to measurements in inclusive proton-proton collisions.