

Single diffraction and elastic scattering in proton-proton collisions with the STAR detector at RHIC

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Abstract

We present results obtained with the STAR detector on single diffraction (SD) and elastic scattering in proton-proton collisions at RHIC energies. The forward scattered protons are tagged in the STAR Roman Pot system. The measurements of inclusive and identified charged-particle spectra in SD at $\sqrt{s} = 200$ GeV are compared to phenomenological models. The proton-antiproton production asymmetry allows studying the baryon number transfer over a large rapidity interval in the SD process. The measured K/π ratio suggests a larger strangeness production at $p_T > 0.5$ GeV/ c in the SD process compared to inclusive proton-proton collisions. In addition, the first measurement of the proton-proton elastic cross section at $\sqrt{s} = 510$ GeV will be presented.