Central Exclusive Production with the STAR detector at RHIC

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Abstract

We present results on the Central Exclusive Production of charged hadron pairs $h^+h^-(h = \pi, K, p)$ obtained in the STAR experiment at RHIC in proton-proton collisions at center-of-mass energies of $\sqrt{s}$ = 200 GeV and 510 GeV. All final-state particles of the process $pp \to p' + h^+h^- + p'$ were reconstructed, including forward-scattered protons detected in the Roman Pot system. As a result, the Double Pomeron Exchange (DPE) events were selected and the non-exclusive backgrounds were efficiently rejected.

At $\sqrt{s}$ = 200 GeV differential fiducial cross sections were measured as functions of observables related to the central hadronic final state and to the forward-scattered protons. The measured cross sections were compared to phenomenological predictions based on the DPE model. Structures observed in the mass spectra of $\pi^+\pi^-$ and K^+K^- pairs were found consistent with the DPE model, while angular distributions of pions suggested a dominant spin-0 contribution to $\pi^+\pi^-$ production. We also present preliminary results on the measurement of the same physics process at higher $\sqrt{s} = 510$ GeV.