

## Measurement of Diffraction with Tagged Forward Protons at STAR

We shall present preliminary results of the physics program with tagged forward protons with the STAR detector at RHIC. The results were obtained in proton-proton collisions at the  $\sqrt{s} = 200$  GeV, with 18 pb<sup>-1</sup> of data. The forward protons are detected in the Roman Pots while the recoil system is measured in the central detector of STAR whose two major systems for this program are the Time Projection Chamber (TPC) and the barrel Time-Of-Flight detector (TOF). The final state proton(s) were tagged in the STAR Roman Pot system while the identified charged particle tracks were reconstructed in the STAR Time Projection Chamber (TPC). The measurements to be discussed are: a) Central Exclusive Production process  $pp \rightarrow pXp$  (CEP), which is dominated by the Double Pomeron Exchange (DPE) mechanism, at this center-of-mass energy; b) Spectra of identified charged particles as pions, kaons and protons and their anti-particle counterparts in Single Diffraction ( $p + p \rightarrow p + X$ ) and Central Diffraction ( $p + p \rightarrow p + X + p$ ) processes. The proton-antiproton production asymmetry as a function of rapidity will also be presented to study the baryon number transfer over a large space in rapidity in single diffraction dissociation process shall be discussed. For the CEP, the central diffractive system is measured in the TPC and the forward protons in the Roman Pots. Hence the exclusivity of the system can be determined by measuring its missing transverse momentum. Using the TPC and TOF for particle identification (PID) various production channels in  $pp \rightarrow pXp$  reaction can be identified. We shall present preliminary results on exclusive production of two charged particles in mid-rapidity region,  $|\eta| < 1$ , with small squared four-momentum transfer of forward protons,  $0.03 < |t_1|, |t_2| < 0.3$  (GeV/c)<sup>2</sup>.

**Primary author:** Dr GURYN, Wlodek (Brookhaven National Laboratory)

**Session Classification:** Soft QCD and Soft Diffraction

**Track Classification:** Soft QCD and soft diffraction