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Recent results on Central Exclusive Production with the STAR detector at RHIC

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The STAR experiment at the Relativistic Heavy Ion Collider (RHIC) performs studies of diffractive processes with the focus on the exclusive production of particles in central range of rapidity. In 2015 STAR collected 18-pb^{-1} of data in polarized proton+proton collisions at $\sqrt{s}\sim 200\text{-GeV}$ to measure Central Exclusive Production process $pp \rightarrow pXp$ (CEP) through Double Pomeron Exchange (DPE) mechanism, which is expected to be dominant at this center-of-mass energy. The intact protons moving inside the RHIC beampipe after the collision were measured in silicon strip detectors, which were placed in the Roman Pot vessels. This enables full control over interaction kinematics and clear verification of the exclusivity of the reaction by measuring the total (missing) transverse momentum of all final state particles: the central diffractive system in the Time Projection Chamber (TPC) and the forward protons in the Roman Pots. With the use of ionization energy loss in the TPC, dE/dx , as well as velocity measured with TPC and barrel Time-Of-Flight detector (TOF) it was possible to discriminate various production channels in $pp \rightarrow pXp$ reaction. We shall present preliminary results on exclusive production of two ($\pi^+\pi^-$, K^+K^- , $p\bar{p}$) and four ($\pi^+\pi^-\pi^+\pi^-$) charged particles in mid-rapidity region, $|\eta| < 1$, with small squared four-momentum transfer of forward protons, $0.03 < |t_1|, |t_2| < 0.3 \text{ (GeV}/c)^2$.

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