

## The Effects of Multiple-Parton Interactions on the Production of Charged Particles and Pentaquarks

This study investigates the Multiple-Parton Interaction (MPI) sensitivity of several charged particle observables, including the charged pseudorapidity distribution, the average transverse momentum as function of charged multiplicity, and the production of individual particle species. The MPI effects on pentaquark production are also studied, for three possible resonance states,  $P_c^+(4312)$ ,  $P_c^+(4440)$  and  $P_c^+(4457)$ . Using the Monte Carlo event generator PYTHIA8, we generate the invariant mass spectrum of these resonances, as decay products of  $\Lambda_b^0$  and molecular states using hadronic rescattering. Furthermore, two approaches to simulate pentaquark production are compared.

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