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Multi-parton interactions with CMS detector at LHC

Multi parton interactions (MPI) are experiencing a growing popularity and are widely invoked to account for observations that cannot be explained otherwise: the activity of the Underlying Event, the rates for multiple heavy flavour production, the survival probability of large rapidity gaps in hard diffraction, etc. The definition, implementation and tuning of multi-parton interactions (MPI) models in Monte Carlo generators plays an important role for the LHC physics and provide a better definition of the collision dynamics and an increased background definition related to new physics searches. CMS was involved into the MPI characterization from the beginning of the LHC data taking, starting from the Underlying Event measurements in Minimum Bias events. With the large integrated luminosity available, the Double Parton Scattering measurements, with two hard events in the same proton-proton collision, can be performed in different final states and at different energy scales. The proposed contribution is intended to review past and ongoing studies on MPI with the CMS detector providing a common interpretation.

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