



Contribution ID: 18

Type: **not specified**

Diffractive excitation in pp and pA scattering at high energies

Tuesday, November 19, 2019 3:55 PM (25 minutes)

We present an update of the Miettinen-Pumplin (MP) model for diffractive excitation for proton-proton (pp) and antiproton-proton ($\bar{p}p$) scattering considering recent LHC data. The energy dependence of the total, elastic, and diffractive cross sections are analyzed and compared to data. The implications of the diffractive excitation in proton-nucleus (pA) collisions are also discussed for different nuclei. We used the MP model to derive the main quantities present in the treatment of the diffractive excitation in pA collisions. We demonstrate that the effect of fluctuations decreases at larger energies and heavier nuclei. We also compare our results with the predictions for the proton dissociation induced by photon interactions.

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Session Classification: MPI & Small-x & diffraction

Track Classification: MPI & Small-x & diffraction