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pp cross-sections: a QCD model compared with TOTEM and other LHC data

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We compare the recently released TOTEM data for the total cross-section at LHC with the predictions of a model based on QCD mini-jets and soft gluon resummation in the infrared. We discuss the implications of the TOTEM measurement and the possible saturation of the Froissart bound. We also examine the dramatic reappearance of the dip in the elastic differential cross-section and discuss it in terms of two asymptotic sum rules for the elastic amplitude. The difficulties of a straightforward usage of the eikonal model concerning the inelastic cross-section are clarified and recently released CMS and ATLAS data are compared with our model. We present predictions for the pp cross-sections at higher LHC energies, 8 and 14 TeV.

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