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A QCD and $N = 4$ SYM Motivated Model for Soft Interactions and LHC Data

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Monte Carlo generators (Pythia and Phojet) which were tuned for energies up to that of the Tevatron, appear to be found wanting when extended to LHC energies.

We have constructed a model that satisfies the theoretical requisites of high energy soft interactions, based on two conjectures:

- (i) the results of $N = 4$ SYM, which at present is a unique theory that allows one to deal with a large coupling constant: and
- (ii) the requirement of matching with high energy QCD.

In accord with these postulates we assume that the soft Pomeron intercept is relatively large, and the slope of the Pomeron trajectory is equal to zero. We derive analytical formulae that sum both enhanced

and semi-enhanced diagrams for elastic and diffractive amplitudes.

We fit the available experimental data, up to and including the

Tevatron energies, and predict the values of cross sections at all energies accessible at the LHC and beyond.

The values we obtained are in agreement with the measured value of the

inelastic cross section at 7 TeV published by the ATLAS collaboration,

and the inclusive cross sections measured by CMS, ATLAS and ALICE.

We compare our results with experimental data and competing models.

Summary

The material summarizes the contents of :

- (1) Eur.Phys.J. (2011)71:1553
- (2) arXiv:1103.4509

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