

HADRONIC INTERACTIONS, PRECOCIOUS UNIFICATION, AND COSMIC RAY SHOWERS AT AUGER ENERGIES

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At Auger energies only model predictions enable us to extract primary cosmic ray features. The simulation of the shower evolution depends sensitively on the first few interactions, necessarily related to the quality of our understanding of high energy hadronic collisions. Distortions of the standard “soft semi-hard” scenario include novel large compact dimensions and a string or quantum gravity scale not far above the electroweak scale. Naïvely, the additional degrees of freedom yield unification of all forces in the TeV range. In this communication we study the influence of such precocious unification during atmospheric cascade developments by analyzing the most relevant observables in proton induced showers.