

Constraints and measurements of hadronic interactions in extensive air showers with the Pierre Auger Observatory

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The characteristics of extensive air showers (EAS) are sensitive to the details of hadronic interactions at energies and kinematic regions beyond those tested by man-made accelerators. Uncertainties on extrapolations of the hadronic interaction models in these regions hamper the interpretation of the ultra high energy cosmic ray data in terms of primary mass composition. We report on how the Pierre Auger Observatory is able to constrain the hadronic interaction models by measuring the muon content and muon production depth of air showers and also by measuring the proton-air cross section for particle production at a center-of-mass energy per nucleon of 57 TeV.

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