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Probing hadronic interactions with measurements from the Pierre Auger Observatory

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The Pierre Auger Observatory is the largest facility in the world to observe ultra-high-energy cosmic rays. It has a hybrid detection technique which combines the observation of the longitudinal development of the shower of secondary particles produced in the atmosphere by the cosmic primary and the measurement of particles at ground. This has allowed the Auger Collaboration to produce results regarding the energy spectrum, mass composition and arrival directions of ultra-high-energy cosmic rays with unprecedented precision. But it also opened the possibility to study hadronic interactions taking place at energies well beyond those accessible by human-made accelerators and, therefore, probe current models tuned to LHC data.

In this report, we present a selection of the latest results on hadronic interactions with measurements from the Pierre Auger Observatory, over three decades at the highest energies, showing the tension between data from the muonic component of air-showers and predictions based on the most updated hadronic models.

Preferred track

Cosmic Rays and Astrophysics

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