

The energy spectrum of cosmic rays above 6 PeV as measured at the Pierre Auger Observatory

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Since 2004, the Pierre Auger Collaboration has measured one of the most important features of ultra-high-energy cosmic rays, the energy spectrum, with unprecedented precision. Located in the Southern hemisphere, the Observatory comprises an array of 1,660 water-Cherenkov detectors covering $\sim 3,000$ km² overlooked by 27 fluorescence telescopes. Five sets of measurements have been used to reconstruct the spectrum from 6 PeV to beyond 100 EeV. The highest-energy events, recorded by surface detectors on a 1,500 m triangular grid, are reconstructed differently depending on their inclination (vertical events below 60° and inclined ones above 60°). A cross-check of these measurements is made using 'hybrid events', in which there are simultaneous detections at both the fluorescence detectors and at least one surface detector. Events with energies below 3 EeV have been studied using a nested array with a spacing of 750 m and using the Cherenkov light recorded with three high-elevation telescopes. In this contribution, updated methods for the reconstruction of all events are discussed, together with their associated uncertainties. A combination of all data sets is reported to construct a spectrum above 6 PeV to the highest energies. A detailed discussion of the spectral features will be presented.

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