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The flux of ultra-high energy cosmic rays after ten years of operation of the Pierre Auger Observatory

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The flux of cosmic rays has been measured with unprecedented precision and statistics at the Pierre Auger Observatory. We report an update of the all-sky flux of cosmic rays above 3×10^{17} eV obtained by combining four independent data sets. These measurements are based on data from the surface detector (divided into two sets according to the shower zenith angle), from a nested denser detector array, and hybrid events measured simultaneously with both the fluorescence detector and the surface detector. The spectral features are presented in detail and the systematic uncertainties are addressed. The huge amount of data collected to date, with a total exposure exceeding $50,000 \text{ km}^2 \text{ sr yr}$, together with the wide range of sky observed (in declination from -90° to 45°) also allow us to measure the energy spectrum from different regions of the sky. We present the results of the search for a dependence of the measured flux on the declination of the incoming directions.

Collaboration

Pierre Auger

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