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Searches for anisotropies in the arrival directions of Ultrahigh Energy Cosmic Rays

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The study of cosmic rays with energies above 10^{18} eV contributes to a better understanding of the Universe. In particular, the study of anisotropy in their arrival directions is an important tool to unravel the sources of such particles. The state of the art in terms of experiments is currently represented by the Pierre Auger Observatory, the largest cosmic ray observatory in the world. Due to its size of $3,000 \text{ km}^2$, it collected an unprecedentedly large data set over 17 years of operation. In this work we describe results related to anisotropy studies obtained by using such events. These are the large-scale searches in the arrival direction of events with energies above 4 EeV and the analysis of arrival directions of the highest-energy events, exceeding 32 EeV. A remarkable dipolar modulation in right ascension for energies above 8 EeV is observed, as previously reported, with a statistical significance of 6.6σ as well as evidence of anisotropy at intermediate angular scale with $\sim 15^\circ$ Gaussian spread at 4σ significance level for cosmic-ray energies above ~ 40 EeV.

Is this abstract from experiment?

Yes

Name of experiment and experimental site

Pierre Auger Collaboration

Is the speaker for that presentation defined?

Yes

Details

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Internet talk

Yes

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