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UHECR results of combined analyses of TA and Auger experiments

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The origin of ultra-high-energy cosmic rays (UHECRs) is still unknown. Their sources are believed to be within the local universe (a few hundred megaparsecs), but deflections by intergalactic and Galactic magnetic fields prevent us from straightforwardly associating UHECRs to their sources based on their arrival directions, making their angular distribution mostly isotropic. At higher energies, the number of potential source candidates and the magnetic deflections are both expected to be smaller, but so is the available amount of statistics. Hence, it is interesting to perform searches for anisotropies using several different energy thresholds. With a threshold of 8 EeV a dipole modulation has been discovered, and with higher thresholds evidence is mounting for correlations with certain nearby galaxies. Neither of the two main UHECR detectors, the Pierre Auger Observatory and the Telescope Array project, has full-sky coverage. Full-sky searches require combining the datasets of both, and a working group with members of both collaborations has been tasked with this. We present an overview of the challenges encountered in such analyses, recent results from the working group, possible ways of interpreting them, and an outlook for the near future.

Summary

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