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TA anisotropy update

We search for anisotropy of ultra-high energy cosmic ray (UHECR) events collected by the Telescope Array detector in the first 3.5 years of operation. Following earlier studies, we consider the event sets with energy thresholds of E>10 EeV, E>40 EeV, and E>57 EeV. First, we calculate the autocorrelation function of the cosmic ray events and find no significant deviations from isotropy at angular scales from 0 to 40 degres in any of the three sets. Next, we check the events with E>57 Eev for correlations with nearby active galactic nuclei and find no significant correlations. Finally, we examine all three sets for correlations with the large-scale structure of the Universe. We find that the two higher-energy sets are compatible with both an isotropic distribution and the hypothesis that UHECR sources follow the matter distribution of the Universe (the LSS hypothesis), while the event set with E>10 EeV is compatible with isotropy and not compatible with the LSS hypothesis at 95% CL at angular scales smaller than ˜15 degrees. We also check whether accounting for the regular Galactic magnetic field can make this set compatible with the LSS hypothesis.

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