

Simulations of the cosmic-ray anisotropy down to TeV energies

Thursday 15 July 2021 12:48 (12 minutes)

We calculate the shape of the TeV-PeV cosmic-ray anisotropy (CRA) in 3D Kolmogorov turbulence. We present the first numerical calculations of the CRA down to TeV energies, using realistic values for the coherence length of the interstellar turbulence. At these low energies, the large-scale CRA aligns with the direction of local magnetic field lines around the observer. In this type of turbulence, the cosmic-ray intensity is flat in a broad region perpendicular to magnetic field lines. Even though the CRA is rather gyrotropic, we show that the local realization of the turbulence around the observer results in the appearance of weak, non-gyrotropic, small-scale anisotropies, which contain important information about the local turbulence level.

Keywords

Cosmic-ray anisotropy; Cosmic-ray propagation; Interstellar turbulence

Collaboration

other Collaboration

Subcategory

Theoretical Results

Primary authors: GIACINTI, Gwenael (MPIK Heidelberg); Dr REVILLE, Brian (MPIK Heidelberg)

Presenter: GIACINTI, Gwenael (MPIK Heidelberg)

Session Classification: Discussion

Track Classification: Scientific Field: CRI | Cosmic Ray Indirect