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TeV anisotropy
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Understanding the anisotropy of cosmic rays in the TeV-PeV energy range

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The anisotropy in the distribution of cosmic-ray arrival directions measured in the TeV-PeV energy range by several experiments shows both large and small-scale structures. While the large-scale anisotropy can be explained within the framework of a diffusive propagation of cosmic rays, the origin of the small-scale structures remains unclear. We investigate the arrival directions of charged particles using numerical three-dimensional Monte-Carlo test-particle simulations, in which the test-particles propagate in a time-independent spatially fluctuating magnetic field derived from a three-dimensional isotropic turbulence power spectrum. However, in contrast to earlier studies, we do not use a backtracking method for the computation of the particle trajectories. It has been recently argued that the turbulent magnetic field itself generates the small-scale structures of the anisotropy if a global cosmic-ray dipole moment is present. Using our test-particle approach, we can test the reliability of that hypothesis.