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Search for cosmic rays in GRANDProto300

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GRANDProto300 (GP300) is a prototype array of the GRAND experiment, designed to validate the technique of autonomous radio-detection of astroparticles by detecting cosmic rays with energies between 10^{17} - $10^{18.5}$ eV. This observation will further enable the study of the Galactic-to-extragalactic source transition region. Since November 2024, 46 out of 300 antennas have been operational and collecting data stably. We present our cosmic ray search pipeline, which involves several filtering steps: (1) coincidence search for signals triggering multiple antennas within a time window, (2) directional reconstruction of events, (3) exclusion of clustered (in time and space) noise events, (4) spectral analysis to remove noise featuring frequency peaks, (5) polarization cut, and (6) selection based on the size of the footprint. The efficiency of the pipeline is evaluated and applied to the first batch of data, yielding a set of candidate cosmic-ray events, which we present.

Collaboration(s)

GRAND

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