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Investigation of the Galactic Magnetic Field using Ultra-High Energy Cosmic Rays

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We present a new method of investigating the galactic magnetic field using public data of ultra-high energy cosmic rays. In comparisons of expected and measured arrival directions of the cosmic rays we evaluate the directional characteristics and magnitude of the field. Our analysis provides first experimental verification of the deflection of ultra-high cosmic rays in the galactic magnetic field. It also reveals directions with increased probability for sources of cosmic rays, and therefore opens new possibilities for investigating cosmic particle origin and acceleration.

Author: ERDMANN, Martin (Rheinisch-Westfaelische Tech. Hoch. (DE))

Co-authors: MUELLER, Gero Lutz (III. Physikalisches Institut (B)-Rheinisch-Westfaelische Tech. H); URBAN, Martin (RWTH Aachen University)

Presenter: ERDMANN, Martin (Rheinisch-Westfaelische Tech. Hoch. (DE))

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