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## Cosmic Ray Propagation Simulations and Spectral Features in the Observed TeV Anisotropy with the HAWC Detector

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With its high duty cycle and large field of view ( $\sim 2$  sr), the High-Altitude Water Cherenkov (HAWC) Observatory

continuously surveys the cosmic ray arrival distribution at very high energies (100 GeV - 1 PeV) in the Northern Sky.

Previous measurements by other air shower experiments at the TeV scale reveal energy-dependent angular features of the cosmic-ray anisotropy at both large (>  $60^{\circ}$ ) and small (<  $20^{\circ}$ ) scales.

With a specially selected two-year data set of cosmic-ray air-shower events and a new statistical method, we present results from HAWC observations confirming the presence of these features at a signal-to-noise ratio  $> 10^{-5}$ .

The event selection allows for improved energy and angular resolution from  $1.4-70.0~{\rm TeV}.$ 

We also present a graphics processing unit (GPU) accelerated simulation that tracks charged particle propagation through magnetic fields, which permits the rapid testing of various field configurations and properties.

We demonstrate the ability to simulate  $10^9$  particles in hour timescales, allowing unprecedented TeV-scale cosmic ray simulation capabilities.

Primary authors: FIORINO, Dan (University of Wisconsin-Madison); HAMPEL-ARIAS, Zig (o=ulb,ou=Institutions,dc=icecube,dc=wisconsin-Madison); HAMPEL-ARIAS, Zig (o=ulb,ou=Ins

**Presenter:** HAMPEL-ARIAS, Zig (o=ulb,ou=Institutions,dc=icecube,dc=wisc,dc=edu)

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