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Energy-dependent Orbital Compton-Getting Dipole with IceCube Cosmic-Ray Muons

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The Compton-Getting effect — an apparent dipolar anisotropy of cosmic rays generated by Earth's orbital motion around the Sun — serves as a known calibration source for cosmic-ray anisotropy studies. The amplitude of the Compton-Getting dipole depends on both the orbital speed and the mean spectral index of the cosmic-ray flux. It therefore provides an indirect method for studying the energy spectrum of cosmic rays. This work will report on a study of the spectral index of cosmic-ray induced muons as a function of energy using data collected over 12 years by IceCube in the 10 TeV to 100 TeV range.

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