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Direct measurement of the all-particle spectrum up to the PeV region with CALET on the International Space Station

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The CALorimetric Electron Telescope (CALET) is a space-based experiment performing direct cosmic-ray observations aboard the International Space Station. Since the start of observations in October 2015, CALET has been continuously collecting scientific data for more than nine years. The instrument is capable of measuring individual cosmic-ray nuclei, covering a wide energy range from a few tens of GeV to the PeV scale, and can precisely identify the charge of each particle. In this study, we present the all-particle cosmic-ray energy spectrum measured with CALET. The spectrum extends close to the 1 PeV region, where indirect measurements have covered higher energies. CALET's direct measurements in this energy range provide valuable insights into the acceleration and propagation of high-energy cosmic rays. In particular, this spectrum is expected to provide new insights that complement indirect measurements of the Knee structure in the all-particle energy spectrum.

Collaboration(s)

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