

Kneelike structure in the spectrum of the heavy component of cosmic rays observed with KASCADE-Grande

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We report the observation of a steepening in the cosmic ray energy spectrum of heavy primary particles at about 8×10^{16} eV. This structure is also seen in the all-particle energy spectrum, but is less significant. Whereas the 'knee' of the cosmic ray spectrum at $3-5 \times 10^{15}$ eV was assigned to light primary masses by the KASCADE experiment, the new structure found by the KASCADE-Grande experiment is caused by heavy primaries. The result is obtained by independent measurements of the charged particle and muon components of the secondary particles of extensive air showers in the primary energy range of 10^{16} to 10^{18} eV. The data are analyzed on a single-event basis taking into account also the correlation of the two observables.

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