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The heavy knee and the light ankle observed with KASCADE-Grande

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Investigations of the energy spectrum as well as the mass composition of cosmic rays in the energy range of PeV to EeV are important for understanding both, the origin of the galactic and the extragalactic cosmic rays. The multi-detector arrangement of KASCADE and its extension KASCADE-Grande was designed for observations of cosmic ray air showers in this energy range. Most important result from KASCADE is the proof that the knee feature at several PeV is due to a decrease in the flux of light atomic nuclei of primary cosmic rays. Recent results of KASCADE-Grande have now shown two more spectral features: a knee-like structure in the spectrum of heavy primaries at around 90 PeV and a hardening of the spectrum of light primaries at energies just above 100 PeV. In this talk the present KASCADE-Grande results on energy spectrum and composition are compared with astrophysical models for the energy range, where the transition from galactic to extragalactic origin of cosmic rays are expected.

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