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PeV Cosmic Rays measured by IceCube/IceTop

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We report on the high-resolution measurements of cosmic ray spectrum and mass composition from the knee region up to 1 EeV based on one year of data collected with IceCube/IceTop. Complementary to the PeV neutrinos, IceCube measures extensive air showers of PeV cosmic rays on the surface with the IceTop array and the penetrating high energy muon bundles with the matrix of detectors in deep ice. The measured spectrum can not be explained by a simple power law beyond the knee, which confirm the other recent measurements (GAMMA, Tunka, Kaskade-Grande). We observe a prominent hardening above 18 +/- 2 PeV followed by a sharp steepening beyond 130 +/- 30 PeV. The composition gets heavier and heavier up to at least 130 PeV as indicated by the steady increase in the measured mean logarithmic mass. The change in shape and amplitude of anisotropy observed by IceCube/IceTop in the arrival direction distributions of cosmic rays at PeV energies will also be discussed.

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