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Primary spectrum and composition with IceCube/IceTop

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IceCube, with its surface array IceTop, detects three different components of extensive air showers: the total signal at the surface, GeV muons in the periphery of the showers and TeV muons in the deep array of IceCube. The spectrum is measured with high resolution from the knee to the ankle with IceTop. Composition and spectrum are extracted from events seen in coincidence by the surface array and the deep array of IceCube. The muon lateral distribution at the surface is obtained from the data and used to provide a measurement of the muon density at 600 meters from the shower core up to 30 PeV. Results will be compared to measurements from other experiments to obtain an overview of the spectrum and composition over an extended range of energy. Consistency of the surface muon measurements with hadronic interaction models and with measurements at higher energy will be discussed.

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