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Cosmic-ray physics with IceCube

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IceCube at the South Pole consists of two components - the IceTop air shower array on the surface and the neutrino telescope at depths from 1450 to 2450 meters below. In its final stage the IceTop detector will consist of 80 stations, each containing two ice Cherenkov tanks, covering a surface of one square kilometer while the neutrino telescope encloses a volume of one cubic kilometer with 4800 photon detectors (digital optical modules or DOMs). Currently 26 IceTop stations and 22 InIce strings are deployed. With the present size of the IceTop array it is possible to measure cosmic rays with energies ranging from 1 PeV to 100 PeV. Coincident events between the IceTop and the InIce detector provide information about the muon content of air showers. Since the number of muons is sensitive to the mass of the primary cosmic ray nucleus these events can be used for cosmic ray composition studies. The current status of IceTop and the ongoing data analysis will be presented.

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