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# Studies of a muon-based mass sensitive parameter for the IceTop surface array

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IceTop is the surface instrumentation of the IceCube Neutrino Observatory at the South Pole. It is designed to measure extensive air showers of cosmic rays in the primary energy range from PeV to EeV. Air showers induced by heavier primary particles develop earlier in the atmosphere and produce more muons observable at ground level than lighter cosmic rays with the same primary energy. Therefore, the fraction of muons to all charged particles measured by IceTop characterizes the mass of primary particles. This analysis seeks a muon-based mass sensitive parameter by using the charge signal distribution for each individual cosmic ray event. In this contribution we present the analysis method for the mass-sensitive parameter and our studies of its possible application to the measurement of cosmic ray mass composition with the IceTop surface array.

## Keywords

IceTop; cosmic ray mass composition

## Collaboration

IceCube

## other Collaboration

## Subcategory

Experimental Results

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