

Muon Energy Reconstruction Methods for the IceCube Neutrino Observatory

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The IceCube neutrino observatory relies on the ability to reconstruct the energies of muon events for a wide range of analyses, including all astrophysical diffuse analyses. Current methods use the mean energy loss rate of the events with good results found after effectively truncating the largest losses. Here we discuss a new energy reconstruction method which uses topological information of the muon track. The method uses a maximum likelihood that interprets the full pattern of reconstructed energy losses from each muon track to obtain a best estimate of the muon energy as the event entered the detector. In this talk the topological method will be compared to previous reconstruction methods via simulated muon event studies, and we also will discuss possible improvements.

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