Contribution ID: **84** Type: **not specified**

Muon Energy Reconstruction in the ANTARES Detector

Wednesday, 12 October 2011 14:00 (20 minutes)

The energy reconstruction of both neutrino induced muons from neutrino interactions in the vicinity of the detector and of muons from cosmic ray air showers contributes indispensable information for a broad range of physics analyses, e.g. by increasing the sensitivity in neutrino point source searches or by offering access to observables such as the atmospheric neutrino spectrum. Currently four energy reconstruction methods are implemented in the ANTARES data analysis framework, ranging from estimates based on photon counting and the total charge deposited in the detector to pdf-based methods and artificial neural networks. These four methods, their performance and systematic studies of the energy resolution capabilities of the ANTARES detector are presented.

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Session Classification: Parallel Session 1

Track Classification: Physics, reconstruction and software