

Improved Neutrino Shower Reconstruction with KM3NeT

Friday, November 5, 2021 2:00 PM (20 minutes)

The IceCube Neutrino observatory has established the existence of a high energy cosmic neutrino flux. The origin of this flux remains elusive, and its discovery is instrumental in understanding cosmic particle accelerators. KM3NeT ARCA is a water cherenkov neutrino telescope aiming at finding high energy cosmic neutrino sources. The new multi-pmt optical module design and water medium gives an opportunity for improved reconstruction methods. When electron neutrinos interact through charged current in KM3NeT, they cause shower-type events. Current reconstruction algorithms for showers already reach a 1.5 degree resolution. We develop a new algorithm which fits the time profile of neutrino showers. An angular resolution of below 1 degree is achieved for electron neutrino charged-current events above 300 TeV. A small improvement in energy resolution is also found. Finally, results of computational optimization efforts are presented.

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Session Classification: Parallel 2C