Contribution ID: **141** Type: **not specified**

Deconvolution Algorithms in IceCube

Since the energy of an incident neutrino is inherently unknown, it has to be inferred from energy-dependent quantities, e.g. the energy loss of secondary particles. The production of secondary particles, however, is a stochastic process, which poses certain challenges for the reconstruction of neutrino energy spectra, which is further made difficult by a limited acceptance and smearing effects introduced by the detector. Mathematically, the reconstruction of a neutrino energy spectrum corresponds to an inverse problem, generally described by the Fredholm integral equation of the first kind. Different algorithms for the solution of inverse problems exist and have been applied in measurements of neutrino energy spectra with the IceCube neutrino telescope. This contribution focusses on the technical aspects of the deconvolution algorithms applied in IceCube analyses, mainly in spectral measurements of muon-neutrino energy spectra.

Primary author: RUHE, Tim (TU Dortmund)

Presenter: RUHE, Tim (TU Dortmund)