Contribution ID: **431** Type: **Poster**

Methods for the suppression of background cascades produced along atmospheric muon tracks

Friday 16 July 2021 12:48 (12 minutes)

The Baikal-GVD detector (Gigaton Volume Detector) is a large-scale neutrino telescope located at a depth of 1366 metres in Lake Baikal. One of its main purposes is to identify high-energy extraterrestrial neutrinos and to locate their sources on the sky. In recent (year 2020), it is a three dimensional array of 2016 optical modules (OMs), sub-arranged into 7 functionally independent units called clusters.

Charged-current interactions of electron neutrino and neutral-current interactions of all three neutrino flavours create a unique light signature of a single "cascade"in the detector. However, cascade pattern can also be produced by discrete stochastic energy losses along the atmospheric muon tracks. These constitute an avoidable background in the search of astrophysical neutrinos. Therefore, different kinds of data analysis methods for the suppression of background events have been developed.

The suppression is achieved by means of the time and charge information of signals detected at the OMs. One of the method tries to find the maximum number of track hits amongst cascade hits, which are present in the muon bundle event. Other techniques rely on the distributions of hits charges and positions of hit OMs associated with cascade events. All suppression tools were developed and optimized on the Monte Carlo simulation datasets.

Keywords

neutrinos; cascades; atmospheric muons; background cascades;

Collaboration

other (fill field below)

other Collaboration

Baikal Collaboration

Subcategory

Experimental Results

Primary authors: BARDAČOVÁ, Zuzana (Comenius University in Bratislava); FOR THE BAIKAL COLLABORATION

Presenter: BARDAČOVÁ, Zuzana (Comenius University in Bratislava)

Session Classification: Discussion

Track Classification: Scientific Field: NU | Neutrinos & Muons