Contribution ID: **1231**   Type: **Poster**

Application of machine learning methods in Baikal-GVD: selection of neutrino-induced events

Monday, 30 October 2023 21:40 (20 minutes)

Baikal-GVD is a large (~1 km^3) underwater neutrino telescope located in Lake Baikal, Russia. This paper presents a neural network for separating events caused by extensive air showers (EAS) and neutrinos. By choosing appropriate classification threshold, we preserve 90% of neutrino-induced events,while EAS-induced events are suppressed by a factor of 10^{-6}. A method for estimating the neutrino flux with minimal error based on neural network predictions has also been developed. The developed neural network employ the causal structure of events and surpass the precision of standard algorithmic approaches.

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Session Classification: In-person poster session & welcome drinks

Track Classification: High Energy Physics