

Implementation of IceTop data in the IceCube Realtime Alert System

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The IceCube Neutrino Observatory is a cubic-kilometer detector at the geographic South Pole searching for astrophysical neutrinos. A realtime analysis framework is implemented for multi-messenger time-domain astronomy. When the data acquisition system identifies candidate neutrinos of astrophysical origin, an alert is sent to the multi-messenger community for rapid follow-up observations. The main background for astrophysical neutrinos is leptons produced in cosmic ray air showers: neutrinos from the northern hemisphere and muons from the southern hemisphere. These atmospheric backgrounds are reduced using a data-driven selection based on the observed event energy and arrival direction. An array of ice-Cherenkov tanks on the surface, IceTop, detects showers of secondary particles created in cosmic ray air showers. We will show that data from IceTop can be used to further reduce the background due to atmospheric muons, and we will describe how it has been implemented within the IceCube alert system.

Reference to paper (DOI or arXiv)

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