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Rapid response to extraordinary events with the IceCube experiment

The discovery of an astrophysical flux of neutrinos with IceCube is a milestone for multimessenger astronomy. Neutrinos open a new window on the high-energy Universe. They provide a complementary view on cosmic accelerators and can help solve the long-standing puzzle of the Ultra-high Energy Cosmic Rays origin.

Thanks to IceCube's capabilities to observe the sky with almost full duty cycle, it is possible to search for transients and possibly alert the community with low latency.

This poster shows a real-time selection pipeline, which allows the identification of muon neutrino candidates. This selection has three products: energetic single neutrinos; neutrino clusters found with a monitoring program of known gamma-ray emitters; clusters found by monitoring the entire sky, without pre-defined source-lists. Alerts are generated from these analyses whenever significant events are recorded, or significant flares develop on time-scales from days to several weeks.

Mini-abstract

Summary of a real-time selection+analysis platform for transient neutrino sources in IceCube.

Experiment/Collaboration

IceCube Collaboration

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