

Improved methods for finding transient neutrino sources with IceCube

The discovery of the neutrino flare from the potential source TXS 0506+056 triggered more searches for time-dependent neutrino emission. However, the search for transient neutrino sources imposes additional challenges. Previous approaches looking for neutrino flares were computationally very expensive. Hence, these searches either required many computational resources or the considered data had to be reduced. We present new approaches on how to identify transient sources and the respective neutrino flare that reduce the necessary computational resources while preserving the sensitivity to transient sources. In this study, we focus mainly on two approaches: the application of unsupervised learning and the parametrization of the test statistic distribution depending on the flare properties.

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