

# A Time-Variability Test for Candidate Neutrino Sources Observed with IceCube

Pranav Dave\* for the IceCube Collaboration  
email: pdave@gatech.edu

- We present a new statistical test to detect time-variability for candidate neutrino sources using 7.5 years of high-energy track-like events in IceCube
- **Motivation:** While an archival search in the direction of blazar TXS 0506+056 found a flare in 2014-2015, the temporal profile of astrophysical neutrino sources is currently unknown. As IceCube observes the universe for longer periods of time, it can be useful to identify steady sources for comparison with their gamma-ray or X-ray emissions to learn more about the environment in which cosmic-rays are produced.
- **Analyses:** We test this new method by injecting single and double box-shaped flares and present IceCube's sensitivity to steady sources. Additionally, we applied this test on 4 most-significant time-integrated neutrino source candidates using 7.5 years of IceCube data.
- **Results:** We find that all 4 sources are consistent with steady source hypothesis but brighter neutrino sources in the future can be characterized using this method.