A New Method for an Untriggered, Source Stacking Search for Neutrino Flares

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Recent results from IceCube regarding TXS 0506+056 suggest that it may be useful to test the hypothesis of multiple neutrino flares, where each flare is not necessarily accompanied by a corresponding gamma-ray flare. An untriggered, time-dependent, source-stacking search would be ideal for testing this hypothesis. Previous methods fit only the largest untriggered flare in the data, however a significant improvment in discovery potential can be achieved by fitting all the flares in the sample simultaneously. In this talk, we introduce a new method specifically tailored to this purpose. This method has the additional benefit of returning a neutrino flare curve, describing the temporal structure of the neutrino data associated with a particular source. We show results of this method applied across 8 years of northern sky IceCube data for a catalog of Fermi 3LAC blazars, as well as a "self-triggered" style catalog consisting of high energy IceCube events.

Authors: LUSZCZAK, WILLIAM (University of Wisconsin-Madison); Dr BRAUN, Jim (University of Wisconsin - Madison); KARLE, ALBRECHT (University of Wisconsin-Madison)

Presenter: LUSZCZAK, WILLIAM (University of Wisconsin-Madison)

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