Every Flare, Everywhere: An All-Sky Untriggered Search for Astrophysical Neutrino Transients Using IceCube Data

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About

- All-sky search for transient sources of astrophysical neutrinos
- Novel multi-flare method implemented to detect multiple flares associated with a single source candidate

Relevance

- Multi-flare method, unlike previous IceCube point-source analyses, allows the detection of multiple flares from a single direction
- Produces neutrino "flare curves" at every location in the sky, allowing an exploration of the temporal variability of neutrino data on an all-sky scale

What was done

Two variants of the multi-flare analysis are used in each hemisphere to search for:

- The most significant pixel (hottest spot search)
- An excess in a subset of sub-threshold hot spots (population test)

Results

- No significant excess of transient neutrino sources was identified
- Upper limits set on the luminosity and density of an all-sky population of sources
- Neutrino "flare curves" produced at the most relevant locations