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Search for point-like sources in the astrophysical muon neutrino flux with IceCube

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Using a sample of neutrino-induced muon track events, IceCube has confirmed the high-energy diffuse astrophysical neutrinos flux, first found in a sample of high energy starting events. In order to identify the sources of this diffuse flux, these muon-neutrino events are ideal because of their excellent angular resolution. Here we present a search for point-like neutrino sources based on the same sample that was used to measure the diffuse high-energy astrophysical muon-neutrino flux with a livetime of seven years. This high purity sample is restricted to the Northern hemisphere and consists of ~425000 events with a median angular resolution of ~1° at 1 TeV that decreases to ~0.3° at 1 PeV. In this analysis an unbinned likelihood maximization is used that is optimized for point-like neutrino emission with the same characteristics as the diffuse muon neutrino flux. The sensitivity improves for sources with an E^{-2} spectrum by 30% compared to previous analysis and is at a level of $E^2 \partial\phi/\partial E = 3 \cdot 10^{-13}\,\mathrm{TeV\,cm^{-2}\,s^{-1}}$. We report about the status of this search and present an analysis searching for a population of neutrino sources, which are too weak to be significant individually.

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