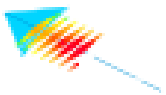

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Astrophysical Neutrino Source Searches with IceCube Starting Track Events

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Muons and neutrinos created by cosmic rays interacting in the atmosphere create a significant background for IceCube astrophysical neutrinos in the southern sky. However, looking for neutrino events that start in the detector can reduce both the atmospheric muon and atmospheric neutrino background while retaining the astrophysical neutrino signal. The method presented here results in a higher astrophysical neutrino purity for IceCube events at declinations less than -25°. We specifically select for track events, which results in better directional reconstruction due to the long path the muon leaves in the detector than for cascade events. Due to the reduced background and good pointing resolution, we will discuss how this event selection will improve IceCube's sensitivity to southern neutrino sources. We will focus on its impact on searches for galactic plane point sources and diffuse galactic plane neutrino emission. This selection also allows IceCube to send out high astrophysical purity realtime alert events with neutrino energies in the tens of TeV to the multimessenger community.

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