

Approximate Intrinsic Directional Resolution Limits in Low-Energy Cascade Reconstruction with IceCube Upgrade

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The IceCube Observatory is a cubic-kilometer neutrino telescope built into the deep glacial ice at the South Pole. The IceCube Upgrade is the future low-energy extension to the existing detector array, characterized by denser instrumentation and improved detection units. This setup will allow us to study neutrino oscillations with greater sensitivity compared to the existing instrumentation, improve neutrino mass ordering studies, and test for the PMNS mixing matrix unitarity with high precision. The reconstruction of event information, in particular the direction of an incoming neutrino, is a crucial ingredient to all of the oscillation analyses. In this poster, we present the approximate resolution limits in directional reconstruction for cascade-like events in IceCube Upgrade and discuss the factors that limit the reconstruction performance. The reconstruction limits are compared with the performances of the state-of-the-art reconstruction algorithms of IceCube.

Poster prize

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