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Improving the reconstruction of neutrinos above 100 GeV in IceCube by direct event simulation[1] SARAH NOWICKI, Michigan State Univ, ICECUBE COLLABORATION — With a distributed array of photosensors over more than 1 cubic-kilometre of the deep Antarctic ice sheet near South Pole Station, IceCube is designed to detect neutrinos above approximately 100 GeV to beyond the PeV-scale. Key to reconstructing the relatively rare neutrino interactions is applying detailed knowledge of the photon transport in the glacial Cherenkov medium. Models based on in-situ calibrations provide the optical properties of the deep ice used to describe the photon propagation. Harnessing the parallel computing power of graphical processing units makes it possible to fully simulate the photon evolution of individual events on-the fly and has opened the possibility of improved precision in reconstructing the event properties. This method of "direct reconstruction" (or DirectReco) may also be used for detailed studies of ice-related systematic errors. Presented will be a description of the DirectReco algorithm as well as the initial estimations of the performance of the IceCube event reconstruction.

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