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## **Direct reconstruction - an advanced event reconstruction algorithm for improved low-energy neutrino analyses with the IceCube-DeepCore detector array**

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The IceCube Neutrino Observatory was designed with the primary goal of detecting very high energy neutrino events beyond the TeV scale from astrophysical sources. A low-energy infill array, DeepCore, was designed to extend the reach of IceCube to events with energies of  $\sim 10$  GeV. At these low energies, there is less recorded event information that introduces challenges for the reconstruction of event properties, including energy and incoming angle. Further, to accurately resolve these quantities requires the ability to incorporate complex models of the natural ice medium. By simulating events in real time in place of approximated tabulated templates, it is possible to include the full description of the glacial detector medium from calibration data. This method of direct reconstruction thus provides the ability to reduce some of our leading, ice-related, systematic uncertainties. A full description of the algorithm, as well as an estimation of its effects on event reconstruction and corresponding impact on DeepCore analyses will be presented.

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