Abstract Submitted
for the APR21 Meeting of
The American Physical Society

Fast Energy Reconstruction using CNNs for GeV Scale Neutrinos in IceCube[1] JESSIE MICALLEF, Michigan State University, ICECUBE COLLABORATION — The IceCube Neutrino Observatory, located deep under the Antarctic ice, detects astrophysical and atmospheric neutrinos. It uses 5160 optical modules spanning a cubic kilometer of ice to detect Cherenkov radiation originating from neutrino interactions. Atmospheric neutrinos at the scale of 10-GeV can be used to measure important fundamental properties of neutrinos such as the oscillation parameters and to search for non-standard interactions. Current likelihood-based reconstructions take seconds to minutes to reconstruct the properties (energy, direction, etc.) of a neutrino event, which makes them computationally challenging for large data sets. In this talk, I will present work showing the optimization of a convolutional neural network (CNN) to reconstruct the energy of 10-GeV scale events in IceCube. This method takes sub-milliseconds per neutrino event, and also offers improvements in the energy resolution.

[1]NSF Graduate Research Fellow, Grant DGE-1848739. IceCube Collaboration, NSF Grant PHY-1913607

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Date submitted: 07 Jan 2021 Electronic form version 1.4