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Studying Saturated DOMs in IceCube ADAM SHANDONAY, University of Wisconsin - Madison, ICECUBE COLLABORATION — Neutrinos provide scientists with an effective way of studying unknown astrophysical objects. However, the detection of neutrinos is challenging and requires large-scale detectors such as the IceCube Neutrino Observatory located at the south pole. IceCube uses photomultiplier tubes (PMTs) to collect Cherenkov light from secondary particles created via CC interactions with neutrinos. PMTs are connected to digital optical modules (DOMs) that digitize electrical signals from the PMTs for analysis. When an excessive amount of Cherenkov light is detected, the waveforms created by these DOMs can become saturated, rendering them less effective for characterizing the neutrino event. Since IceCube collects millions of events, an efficient algorithm was developed to identify saturated DOMs and aggregate them accordingly for ease of analysis. Then checks were conducted on the processed data by looking for depth dependence in the number of events. The data was used to create a distribution of waveform peaks associated with each DOM to look for variation in how the DOMs respond to saturation. This collection of aggregated data and these analyses elucidate the nature of IceCubes DOMs, allowing for more accurate reconstruction of neutrino events.

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