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Simulated Optical Efficiency of the IceCUBE Matryoshka WOM

PATRICK BEDARD, Reed College, THOMAS WESTER, CARLOS ARGUELLES, JANET CONRAD, MIT, JENNA SMITH, Reed College — The IceCUBE Neutrino Observatory is designed to detect high-energy neutrinos of astrophysical origin via Cherenkov radiation detectors located deep within the Antarctic ice. The Wavelength-shifting Optical Module (WOM), a Cherenkov light detector with scalable photosensitive area and very low noise has been proposed to replace current detectors at IceCUBE in order to detect lower energy astrophysical neutrinos from extragalactic supernovae. The Matryoshka WOM, one possible style of WOM, consists of one WOM within a larger WOM in order to increase the overall sensitivity of the detector. I will present the methods used in a series of simulations made with the Reactor Analysis Tool (RAT) to simulate the optical efficiency of a variety of possible Matryoshka WOM configurations. I will also present the results of these simulations demonstrating how the optical efficiency of the Matryoshka WOM compares with similar Cherenkov radiation detectors.

Patrick Bedard
Reed College

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