Abstract Submitted for the DNP11 Meeting of The American Physical Society

Simulating Radioactive Decays in Next Generation Geoneutrino Detectors MEGAN GEEN, Wheaton College, Norton, MA — From analyzing geological samples, the radioactive decays from isotopes 238 U, 232 Th, and 40 K are believed to produce most of the Earth's internal energy. To confirm how much energy these three isotopes are producing, scientists can measure the number of anti-neutrinos (geoneutrinos) which are a product of these decays. While other particles produced by these decays are stopped within the Earth through various interactions and never make it to our detectors, geoneutrinos do not interact and get stopped as frequently making them a good indicator of how many decays actually occur below the Earth's crust. Unlike old geoneutrino detectors, we are developing a new detector that takes advantage of total internal reflection to reduce the number of photomultiplier tubes needed and improve our ability to identify the particle type that reacted within the detector. I will be presenting how we take advantage of total internal reflection in the new detector's design and how we identify when a geoneutrino has reacted within the detector based on Monte Carlo simulations.

Megan Geen Wheaton College, Norton, MA

Date submitted: 29 Jul 2011

Electronic form version 1.4