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Simulation study of Ocean Bottom Detector(OBD) for observation of geo-neutrinos from the mantle

By the observation of geo-neutrinos originating from radioactive isotopes in the Earth (238U,232Th), we can know the amount of radioactive isotopes and the radiogenic heat which governs the Earth dynamics.
Ocean Bottom Detector can observe geo-neutrinos from the mantle directly. Unlike existing other neutrino detectors, OBD detects neutrinos on the seafloor. Given that the oceanic crust is thinner than the continental crust and has lower densities of U and Th, ~70% of anti-neutrinos at OBD come from the mantle. Another unique feature of OBD is keeping the distance from the reactors which are the main background sources for continental detectors. In addition, this movable detector can observe at multiple points in the ocean.
Currently we are considering the detector design. I estimated backgrounds from structures of detector and set upper limit of amount of isotopes. We will present results of detector design based on MC simulation.

Mini-abstract

Detector design of Ocean Bottom Detector with MC simulation for mantle geo-neutrino measurement

Experiment/Collaboration

Ocean Bottom Detector

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