

Deep underwater particle searches in the Hades.

Friday 14 June 2019 18:00 (3 hours)

A solid state detector (CCDs as DAMIC-CONNIE) in the deep ocean is proposed for an energy scale of MeV neutrinos. An instrument designed to be portable and operate in the depths can perform unique measurements of geo and supernova neutrinos, becoming the ultimate geoneutrino detector. Taking into account the positions of the detectors that form the SNEWS it was determined which would be the optimal positions of this new detector that will minimize the Earth shadowing probability as well as maximize the collective determination of the direction of the source. On the other hand the Atacama trench in the Pacific Ocean with a recorded depth of 8 km is an extremely low cosmic radiation environment with higher standards in that sense than the current underground laboratories. This would allow the detection of weakly interacting particles such as neutrinos or dark matter. The radiation conditions are analyzed as noise vs an hypothetical signal of neutrinos at the site. To compute the geoneutrino flux the CRUST 1.0 and PREM model was used to approximate the contribution of the richness of radioactive material present in different layers of the Earth. Elastic scattering with atomic nuclei and electrons is established as the most advantageous detection method for these particles focusing on a silicon lattice array for which the background is investigated. Cosmic radiation is also analyzed to try to simulate this interaction at the site.

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