

Reactor neutrino background at the proposed LAGUNA sites

LAGUNA (Large Apparatus for Grand Unification and Neutrino Astrophysics) is a European project aimed at the construction of a very large volume underground neutrino observatory of the next generation. At the present stage 3 detector technologies and 7 potential locations are being evaluated. The physics scope of LAGUNA includes studies, among others, of diffused supernova neutrinos and geoneutrinos in which events are overlapping with the neutrino spectrum from the fission of reactor fuel. A high flux of these reactor neutrinos, for instance in the proximity of a nuclear power plant, would significantly reduce the sensitivity of the detector to neutrinos with energy below 8 MeV. To make the comparison, a comprehensive database was assembled containing location and thermal power of all the commercial nuclear power plants operating in 2009. Using the database and the known antineutrino spectra associated with the beta decay following fission, the flux for each seven site was calculated. The calculations take into account neutrino oscillations. To make the results easier to compare, they are also given as the expected event rates in 1 kiloton of liquid scintillator (containing 10^{32} of free protons).

Author: Mr LOO, Kai (University of Jyväskylä)

Co-authors: Dr ENQVIST, Timo (University of Oulu); Dr TRZASKA, Wladyslaw (University of Jyväskylä)

Presenter: Mr LOO, Kai (University of Jyväskylä)