Reactor neutrino experiments: Recent results and future potential

Dr. Christian Buck

Max-Planck-Institut für Kern und Teilchen- und Astroteilchenphysik

Heidelberg

Nuclear reactors are strong, pure and localized sources of electron-antineutrinos. Therefore, several of the most relevant parameters to describe neutrino oscillations could be studied in the vicinity of reactor cores. Moreover, experiments at very short baselines were testing the hypothesis of oscillations involving sterile neutrino states. In this context, the final results of the Stereo experiment will be presented. The common detection method in most reactor neutrino experiments is the inverse beta decay on hydrogen nuclei in organic scintillators. The higher cross section in coherent elastic neutrino nucleus scattering offers the possibility to measure the neutrino flux with much more compact detectors. This approach is investigated in the CONUS experiment using germanium detectors as neutrino target. The technologies developed in the last years might allow to use neutrino detectors for reactor monitoring and safeguard applications in the future.