ID de Contribution: **22** Type: **Non spécifié**

Overview of experimental results on geoneutrinos

jeudi 6 juillet 2023 09:35 (35 minutes)

Thanks to the progress in neutrino-detection techniques, geoneutrinos, antineutrinos from the decays of long-lived radioactive elements inside the Earth, can be detected and exploited as a unique tool to study our planet. Geoneutrinos from the 238U and 232Th radioactive chains with energies above 1.8 MeV were measured by the KamLAND experiment in Japan and the Borexino experiment in Italy, exploiting the charge-current inverse-beta decay interaction on protons. Both detectors are located underground and feature large volume liquid scintillator target. The most relevant backgrounds to geoneutrino measurement are represented by reactor antineutrinos, residual muon flux, and intrinsic radioactivity of the detector. Both experiments reached similar precision of the geoneutrino signal measurement in the range of 15 to 18% and confirmed a general consistency of the measured signal with the geological expectations. Due to the different geological settings and geographical locations, their results are complementary. Assuming a laterally homogeneous mantle, their measurements feature some level of tension: Borexino prefers geological models predicting higher U and Th abundances, while KamLAND favors their lower abundances. The talk will describe the key elements of the analysis, overview of the latest results and their geological interpretation, in terms of the corresponding radiogenic heat, geoneutrino signal from the Earth's mantle, and the limit to the hypothetical georeactor.

Orateur: Prof. LUDHOVA, Livia (IKP-2 Forschungszentrum Juelich)

Classification de Session: Mantle-crust connection, geoneutrinos and Earth's heat budget