Contribution ID: **114** Type: **Poster**

SoLid: Search for Oscillations with Lithium-6 Detector at the SCK•CEN BR2 reactor

Sterile neutrinos have been considered as a possible explanation for the recent reactor and Gallium anomalies arising from reanalysis of reactor flux and calibration data of previous neutrino experiments. A way to test this hypothesis is to look for distortions of the anti-neutrino energy caused by oscillation from active to sterile neutrino at close stand-off (~ 6-8m) of a compact reactor core. Due to the low rate of anti-neutrino interactions the main challenge in such measurement is to control the high level of gamma rays and neutron background. The SoLid experiment is a proposal to search for active-to-sterile anti-neutrino oscillation at very short baseline of the SCK•CEN BR2 research reactor.
This experiment uses a novel approach to anti-neutrino detection with a highly segmented detector based on Lithium-6. High experimental sensitivity can be achieved compared to other state-of-the-art technology with the combination of high granularity, high neutron-gamma discrimination using 6LiF:ZnS(Ag) and precise localisation of the Inverse Beta Decay products. This compact system requires minimum passive shielding allowing for very close stand off to the reactor. This poster will introduce the BR2 reactor and experiment set up of the SoLid experiment. The principle of detection and detector design with expected performance will be described and the expected sensitivity to new oscillations will be presented.

Primary author: Dr VACHERET, Antonin (University of Oxford)

Co-authors: Prof. WEBER, Alfons (University of Oxford and STFC/RAL); Mr RYDER, Nicholas (University of Oxford); Dr SCOVELL, Paul (University of Oxford)

Presenter: Dr VACHERET, Antonin (University of Oxford)

Track Classification: Short Baseline Oscillations / Sterile Neutrinos / Non-standard Oscillations