

## **SoLid: An innovative antineutrino detector for searching oscillations at the SCK•CEN BR2 reactor**

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The SoLid experiment intends to search for active-to-sterile anti-neutrino oscillation at the very short baseline of the SCK•CEN BR2 research reactor (Mol, Belgium). A novel detector approach to measure reactor anti-neutrinos was developed based on an innovative sandwich of composite Polyvinyl-Toluene and  $6\text{LiF:ZnS}$  scintillators. The system is highly segmented and read out by a network of wavelength shifting fibers and MP-PCs. High experimental sensitivity can be achieved compared to other standard technologies thanks to the combination of high granularity, high neutron-gamma discrimination using  $6\text{LiF:ZnS(Ag)}$  scintillator and precise localisation of the Inverse Beta Decay products. This technology can be considered as a second generation antineutrino detector. This compact system requires limited passive shielding and relies on spatial topology to determine the different classes of backgrounds. We will describe the principle of detection and the detector design. Particular focus on the neutron discrimination will be made, as well as on the capability to use cosmic muons for channel equalization and energy calibration. The performance of the first full scale SoLid module 1 (SM1), based on the data taken at BR2 in February 2015, will be presented. We will conclude with the next phase, that will start in 2016, and the perspectives of the experiment.

**Primary author:** ABREU, Yamiel (Universiteit Antwerpen)

**Presenter:** ABREU, Yamiel (Universiteit Antwerpen)

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