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Calibration of the highly segmented SoLid antineutrino detector

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SoLid is a short baseline neutrino experiment, which is currently operating a 1.6 tons detector at the SCK•CEN BR2 research reactor in Belgium. SoLid will address the study of the so called Reactor Antineutrino Anomaly (RAA), whose origin could be the existence of a light sterile neutrino state with a mass around the eV scale. In addition, it will perform a new measurement of the antineutrino energy spectrum produced by the 235-U isotope, which will help in the understanding of the 5-MeV distortion observed in previous reactor antineutrino experiments.
SoLid leverages a novel technology, combining PVT cubes of 5×5×5 cm^3 dimensions and ^{6}LiF:ZnS(Ag) screens of ~250 μm thickness. To detect antineutrino interactions, signals are readout by a network of wavelength shifting fibers and SiPMs. The fine granularity (12800 cells) provides powerful tools to distinguish signal from background, but presents a challenge in ensuring homogeneous detector response and calibrating the energy scale and neutron detection efficiency. In this poster the methods that have been developed for the calibration of such a segmented detector will be described. In addition, the calibration results will be presented.

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