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P3.073 **Scintillation light production, propagation and detection in the STEREO reactor antineutrino experiment**

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The Stereo experiment aims to test the hypothesis of sterile neutrinos being the cause of the reactor antineutrino anomaly at short baselines. The detector is centered about 10m away from the compact 58MW research reactor at the ILL in Grenoble, France. Under this setup neutrinos emitted from the reactor will be detected via Inverse Beta Decay on H nuclei within the 1800 liter target volume, consisting of six identical cells stacked along the direction of the core. The target cells will be filled with organic liquid scintillator (LS) doped with Gadolinium (Gd). The antineutrino signal is characterized of a prompt positron event and a delayed neutron capture on Gd. The scintillation light generated in this coincidence signal will be collected by photomultiplier tubes (PMTs).

Over the course of several decades, organic LS have formed the basis for successful reactor neutrino detectors. The main requirements for the Gd doped LS in Stereo are compatibility with detector materials as the acrylic vessels, transparency, light yield, pulse shape discrimination capabilities as well as chemical and optical stability over several years of data taking. With these conditions in mind, the composition of the LS is mainly a mix of LAB, PXE and DIN combined with the two wavelength-shifters PPO and Bis-MSB. The properties of the final mixture after the full scale production will be presented.

The scintillation light in Stereo is detected by 48 eight inch PMTs on top of the detector. A correct performance of the PMTs has been ensured through several tests. Typical characteristics as gain, single photoelectron peak, time behaviour, dark rate and afterpulse ratio were measured and successfully contrasted with the manufacturer values. Presently the PMTs are installed inside the detector and prepared for the imminent data taking.