SIMULATION ENVIRONMENT OF C14 EXPERIMENT

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The hydro-carbon based liquid scintillators will always have an experimental detection threshold, caused by the intrinsic content of radiocarbon (^{14}C). This unavoidable background screens especially the solar neutrinos coming from the pp-chain.

In order to study the variations of ^{14}C levels of different scintillator samples, the C14 experiment is being built in a new deep underground laboratory at the Pyhäsalmi Mine. The detector setup consists of a quartz vessel of 1.6 liters containing the scintillator sample, two acrylic light guides and two low-activity PMTs depicted in Figure 1.

To better understand the performance of the detector, the simulation environment utilizing Geant4 toolkit [1] have been constructed. The environment is suited, for example, to studies related to detector response to the ^{14}C signal along with other background sources and optimization of the detector geometry.

Figure 1: A pictorial representation of the scintillator detector.

[1] https://geant4.web.cern.ch/geant4/