

Background characterization of the SABRE experiment

SABRE (Sodium Iodide with Active Background Rejection) is a new project to search for the annually modulating signal expected from Dark Matter (DM), using an array of ultra-pure NaI(Tl) detectors surrounded by an active scintillator veto to further reduce the intrinsic and external background.

The first phase of the experiment is the SABRE Proof of Principle (PoP), a single 5-kg crystal detector to be operated inside a liquid scintillator veto at LNGS in Italy. The installation of the PoP setup has been completed in LNGS Hall C with the goal of running in 2019 and performing the first in situ measurement of the crystal background and testing the veto efficiency. According to detailed Monte Carlo simulations of the setup geometry, the crystal intrinsic and cosmogenic backgrounds will be characterized in a few months.

The second phase of SABRE will consist in twin arrays of NaI(Tl) detectors operating at LNGS (Italy) and at SUPL (Australia). By locating detectors in both hemispheres, SABRE will minimize seasonal systematic effects.

In this talk, the status report of the SABRE-PoP activities at LNGS will be presented as well as results from the most recent background model based on simulations and radio-purity measurements.

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