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The SABRE South Data Acquisition System

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The SABRE (Sodium-iodide with Active Background REjection) South experiment, located at the Stawell Underground Physics Laboratory (SUPL) in Australia, aims to measure an annual modulation in dark-matter interactions using ultra-high-purity NaI(Tl) crystals. In partnership with the SABRE North effort at the Gran Sasso National Laboratory (LNGS), SABRE South is designed to disentangle any seasonal or site-related effects from the dark matter-like modulated signal observed by DAMA/LIBRA in the Northern Hemisphere.

SABRE South is instrumented with 7 ultra-high-purity NaI(Tl) crystals surrounded by a liquid scintillator veto, and covered by 8 plastic scintillator muon detectors. Each NaI(Tl) crystal and muon detector is coupled to 2 photomultiplier tubes (PMTs) and a further 18 PMTs are used to detect interactions in the liquid scintillator giving a combined total of 48 channels. The SABRE South DAQ utilises a number of CAEN digitizers to acquire data from all these channels while a CAEN logic-unit is used to trigger data acquisition. These are controlled and monitored using custom software which interfaces with EPICS. In addition, control and monitoring of the PMT voltage supplies, environmental sensors, and calibration tools have also been integrated into this system.

In this presentation, the design and status of the SABRE South DAQ will be discussed.

Minioral

Yes

IEEE Member

No

Are you a student?

No

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