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Type: **Talk**

The SABRE South Experiment at the Stawell Underground Physics Laboratory

Tuesday 6 September 2022 16:10 (20 minutes)

The SABRE (Sodium iodide with Active Background REjection) experiment aims to detect an annual modulation signature in the rate of events observed due to dark matter interactions in ultra-high purity NaI(Tl) crystals in order to provide a model independent test of the signal observed by DAMA/LIBRA. It is made up of two separate detectors; SABRE South located at the Stawell Underground Physics Laboratory (SUPL), in regional Victoria, Australia, and SABRE North at the Laboratori Nazionali del Gran Sasso (LNGS).

SABRE South is designed to disentangle seasonal or site-related effects from the modulating dark matter-like signal. It is instrumented with ultra high purity NaI(Tl) crystals immersed in a linear alkyl benzene based liquid scintillator veto, further surrounded by passive steel and polyethylene shielding and a plastic scintillator muon veto. Significant work has been undertaken to understand and mitigate background processes, taking into account radiation from detector materials, from both intrinsic and cosmogenically activated sources as a very low background rate is essential to confirm or refute the results from DAMA/LIBRA.

SUPL is a newly constructed facility located 1024 m underground (~ 2900 m water equivalent) within the Stawell Gold Mine and is scheduled to be completed in June 2022. In addition to hosting the SABRE South experiment, this laboratory will house rare event physics searches, as well as measurement facilities to support low background physics experiments and applications such as radiobiology and quantum computing. The assembly of the SABRE South detector is planned to start once SUPL is finalised, with its commissioning occurring in 2023.

This talk will report on the newly built SUPL and the current status of the SABRE South experiment as well as present recent results from a detailed simulation of the SABRE South detector in order to characterise the background for dark matter searches.

Is this abstract from experiment?

Yes

Name of experiment and experimental site

SABRE South at the Stawell Underground Physics Laboratory Australia

Is the speaker for that presentation defined?

Yes

Details

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Internet talk

No

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