

# Radio-impurity studies for dark matter detection with the SABRE South experiment

Friday 19 July 2024 20:40 (20 minutes)

The aim of the SABRE (Sodium-iodide with Active Background REjection) experiment based in Australia is to detect an annual rate modulation from 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.

Radionuclides from intrinsic and cosmogenic processes including  $^{40}\text{K}$ ,  $^{210}\text{Pb}$ ,  $^{232}\text{Th}$  and  $^{238}\text{U}$  provide a fundamental limit to the sensitivity of SABRE. Radiation from these isotopes must be studied and quantified in order to distinguish it from dark matter events.

In this talk the chemical procedures, sample preparation as well as sample measurement techniques for radio-impurities in SABRE are conferred. The focus of is being put on the experimental challenges for the measurements of the dominant radio-impurities in the SABRE crystal background:  $^{40}\text{K}$  measured via inductively coupled plasma mass spectrometry and  $^{210}\text{Pb}$  measured via accelerator mass spectrometry.

## Alternate track

1. Accelerator: Physics, Performance, and R&D for Future Facilities

## I read the instructions above

Yes

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