



Canadian Association  
of Physicists

Association canadienne  
des physiciens et physiciennes

Contribution ID: 2126

Type: **Poster (Non-Student) / Affiche (Non-étudiant(e))**

## **POS-46 A Sensitive Assay Technique for $^{210}\text{Pb}$ in Water Developed for the SNO+ Experiment**

*Tuesday 12 June 2018 18:02 (2 minutes)*

SNO+ is a multipurpose neutrino physics experiment adapting the Sudbury Neutrino Observatory (SNO) detector located 2 kilometers underground in the SNOLAB facility in Sudbury, Canada. A sensitive technique to assay  $^{210}\text{Pb}$  in water was developed by SNO+. For the lower energy measurements of interest to SNO+, radon daughter radioisotopes, especially  $^{210}\text{Po}$  and  $^{210}\text{Bi}$  supported by  $^{210}\text{Pb}$ , are important. Since water will be used in the purification of both the liquid scintillator and the tellurium that will be chemically loaded in SNO+ to search for neutrinoless double beta decay, the  $^{210}\text{Pb}$  assay technique will be used to carefully monitor and control  $^{210}\text{Pb}$  levels in the water. The technique is capable of measuring  $0.4 \pm 0.13 \text{ mBq/m}^3$  of  $^{210}\text{Pb}$  for a 10 tonne assay. This  $^{210}\text{Pb}$  procedure represents an extension of the water assay technique, based on the capture of Ra and Th radioisotopes using Hydrous Titanium Oxide (HTiO), that was developed by the SNO experiment. Ra sensitivities equivalent to  $^{232}\text{Th}$ :  $4 \times 10^{-16} \text{ gTh/D}_2\text{O}$  and  $^{238}\text{U}$ :  $3 \times 10^{-16} \text{ gU/g D}_2\text{O}$  were achieved with this technique (NIM A 604: 531-535 (2009)). The HTiO technique will be used in SNO+ to monitor  $^{238}\text{U}$  and  $^{232}\text{Th}$  contamination levels in the shielding water and the performance of the water purification system at SNOLAB.

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**Session Classification:** PPD Poster Session & Finals: Poster competition and Mingle session with Industrial partners/employers (5) | Session d'affiches PPD et finales: Concours d'affiches et rencontres avec partenaires industriels et employeurs (5)

**Track Classification:** Particle Physics / Physique des particules (PPD)