

The Canadian Astroparticle physics Summer Student Talk (CASST) Competition 2023

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Quality assurance plan for the TeA plant

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The SNO+ detector is located 2km underground in Sudbury, Ontario. The primary purpose of the experiment is to study extremely rare neutrinoless double beta decay using Te-130 as the double beta decay isotope. Te-130 was chosen due to its high natural abundance and high energy double beta decay end point. The detector will be initially loaded with 0.5% Tellurium which corresponds to 4 tons of synthesized Te. As the detector is studying very rare low energy events SNO+ has a very limited background budget, therefore any active medium in the detector must go through a series of purification steps. To maintain the low levels of backgrounds a Telluric acid purification plant has been built underground and is currently under commissioning phase. The Telluric acid will be processed through the TeA plant where it will be put through rigorous cleaning steps to pull out any heavy metal impurities such as cosmogenic impurities, uranium and thorium through filtration, recrystallization and rinsing. A test run is scheduled to be done in November 2023 which will determine the effectiveness, safety and purification capability of the plant. An extensive quality assurance plan is developed to understand the processes and overall yield of the plant.

Topics - Please choose one:

Author: BAKER, James (SnoLab Student)

Presenter: BAKER, James (SnoLab Student)

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