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Radon Measurements and the Lucas Cell System

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Radon-222 is a naturally occurring radioactive gas originating from the Uranium-238 decay chain. Its presence is problematic in highly sensitive, low-background experiments such as dark matter or neutrino-less double beta decay searches, as it can mask events of interest. To evaluate Radon-222 levels in the SNO+ experiment, volumes from the cover gas system are passed through the radon board, where Radon atoms are subsequently trapped and transferred to a Lucas Cell counter. Putting the Lucas Cell on a photomultiplier tube and applying a voltage allows for the counting of alpha pulses and subsequently, the determination of the number of radon atoms. To improve the accuracy of results, several components of this system require testing. In this talk, I will present the efficiency measurements of the radon board, the Lucas Cell background levels, and various updates made to the entire data collection process.

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