Abstract Submitted
for the APR20 Meeting of
The American Physical Society

Examining the Effect of Airflow on Radon Plate-out Rates[1] TAYLOR WALLACE, ROBERT CALKINS, DANIEL JARDIN, JODI COOLEY, Southern Methodist University — The SuperCDMS Generation 2 dark matter experiment is currently being constructed at SNOLAB in Sudbury, Ontario to detect dark matter candidates less than 10 GeV/c^2 in mass using cryogenic germanium and silicon detectors. One major source of contamination for these detectors is gaseous radon progeny which can plate-out (stick) to detector components and limit sensitivity. Thus, it is imperative that steps be taken to minimize radon plate-out in these experiments. Many environmental factors can affect the rate of radon plate-out, including airflow from ventilation systems. To understand the role of airflow in radon plate-out rates, controlled plate-out tests were conducted inside an annular rectangular exposure chamber equipped with a variable speed fan, anemometer, and a copper plate. A Pylon radon flow-through source supplied a controlled concentration of radon-222 to the exposure chamber. Measurements of the surface activity of polonium-214 were used as a proxy for the number of atoms deposited on the copper plate. Data shows an increase in plate-out on the copper plate when airflow is present. Findings from this study can be used to aid in handling methods for ultra-sensitive detectors and can help develop models to predict how plate-out rates depend on airflow.

[1]This work was supported by the NSF under award number PHY1707704, the Hamilton family, and the SMU URA.

Taylor Wallace
Southern Methodist University

Date submitted: 10 Jan 2020 Electronic form version 1.4