

Measurement of the Emanation of Radon-222 from Cathode High Voltage Tubing for the LUX-ZEPLIN Dark Matter Experiment

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Popularized in science fiction as a common source of spacecraft fuel, dark matter, which composes approximately 85% of the universe's mass, remains highly elusive. The LUX-ZEPLIN (LZ) Dark Matter experiment seeks to address this "elephant in the room" by providing the first direct observation of dark matter. An interaction that can mimic that of dark matter is the beta decay of Pb-214, the grand-daughter of Rn-222, which has traces in almost every material on the planet. To mitigate these ubiquitous false signals, the South Dakota School of Mines and Technology has employed the Radon Emanation System to assess radon diffusion rates, allowing researchers to build a background profile for the LZ experiment. My analysis of the Polonium decay rates of LZ's Cathode High Voltage Tubing indicate that the material provides a negligible contribution to LZ's radiation limit.