Abstract Submitted for the DNP12 Meeting of The American Physical Society

Removal of Long-Lived Radon Daughters by Electropolishing Thin Layers of Stainless Steel JAMES WHITE, RICHARD SCHNEE, RAY-MOND BUNKER, MICHAEL BOWLES, Syracuse University, PRISCILLA CUSH-MAN, MATTHEW EPLAND, MARK PEPIN, University of Minnesota, VINCE GUISEPPE, University of South Dakota — Long-lived alpha and beta emitters in the Radon decay chain on detector surfaces may be limiting background in many experiments attempting to detect dark matter or neutrinoless double beta decay. To screen detector surfaces for this radioactive contamination, a low-radiation, multiwire proportional chamber (the BetaCage) is under construction. Removal of Pb-210 implanted on its 25-micron stainless steel wires without causing significant variation in the diameter of the wires is critical to the BetaCage's ultimate sensitivity. An apparatus to perform electropolishing trials to remove roughly a micron of material has been assembled. These trials have shown promising results. Stainless steel square samples implanted with Pb-210 have shown counts with a reduction factor greater than 10 after electropolishing according to gamma assay. Furthermore, alpha counting has produced similar results, with a reduction factor greater than 100. Lastly, the diameters of wires after electropolishing have remained sufficiently uniform, with reduction in thickness consistent with expectations.

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Date submitted: 31 Jul 2012

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