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Determination of Depletion Depths and Non-Uniformities in Thick Large Area Resistive Strip Silicon Detectors MARK SIKORA, S.D. PAIN, J.A. CIZEWSKI, J.S. THOMAS, K.L. JONES, Rutgers Univ., D.W. BARDAYAN, J.C. BLACKMON, M.S. SMITH, ORNL, J.M. JAMES, R.J. LIVESAY, Colorado School of Mines, M.S. JOHNSON, ORAU, R.L. KOZUB, Tenn. Tech, B.H. MOAZEN, C.D. NESARAJA, Univ. of Tenn. — High quality radioactive beams available at the HRIBF at ORNL enable the study of neutron-rich nuclei far from the valley of stability using (d,p) reactions performed in inverse kinematics. Obtaining data on nuclei in this region is important to our understanding of the development of nuclear structure away from stability, and is of interest to nuclear astrophysics. To perform these reactions requires proton detection with high solid angular coverage, with high resolution in energy and position. The Oak Ridge Rutgers University Barrel Array (ORRUBA) is a silicon detector array under development, comprised of two rings of resistive-strip silicon detector telescopes. Alpha-particle tests on the thick (1000μm) prototype detectors have indicated regions of poor charge collection, present at near full-depletion bias voltages. However, such alpha-particles only penetrate 3% of the thickness of the detector. Measurements currently being carried out with elastically scattered protons will test the detector response throughout its entire volume and will benchmark the dependence of the position resolution on the deposited energy in the ΔE detector. The analysis of these measurements will be reported.

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