

Abstract Submitted
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Design of a low background cryostat for a 1.3 kg low-noise, high purity germanium gamma-ray spectrometer JOHN ORRELL, CRAIG AALSETH, Pacific Northwest Natl Lab, JUAN COLLAR, University of Chicago, JIM COLARESI, CANBERRA, JIM FAST, TODD HOSSBACH, CORY OVERMAN, BRENT VANDEVENDER, Pacific Northwest Natl Lab, MIKE YOCUM, CANBERRA — Recent progress on the development of very-low-energy threshold high-purity germanium ionization spectrometers has produced an instrument of 1.3 kg mass and noise performance of less than 100 eV full-width half-maximum for a peak generated with an electronic pulser as input. The detector was installed in a low-background cryostat intended for use in a low-mass WIMP dark-matter search. The integrated detector and low-background cryostat achieved noise performance of 98 eV full-width half-maximum for an electronic pulser-generated peak and gamma-ray energy resolution of 1.9 keV full-width half-maximum at the ^{60}Co gamma-ray energy of 1332 keV. This presentation describes the low-noise and low-background design considerations employed, the thermal characterization of the low-background cryostat, the specifications of the newly prepared 1.3 kg p-type point contact germanium detector, and the baseline performance of the integrated detector and cryostat.

John Orrell
Pacific Northwest Natl Lab

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