Abstract Submitted
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Radioactive gases for calibration of the UCNA Experiment BRITTNEY VORNDICK, NC State University, UCNA COLLABORATION — Calibration procedures using activated Xe and Ar now play an important role in the UCNA experiment. Both species are frozen into the ultracold neutron (UCN) production volume of the Los Alamos UCN source and activated primarily by the cold neutron flux inside the production volume. Natural Xe with an absorption cross section of roughly 24 barns is activated in the UCN source and then transferred into a LN2-cooled storage volume coupled to the UCNA spectrometer. The ^{135}Xe ($\frac{3}{2}+$), with a lifetime of about 9 hours, which has a 912.5keV-endpoint beta decay, is of greatest importance to UCNA. Activated Xe is leaked into the decay volume, providing a uniform source of beta-radiation filling the acceptance of the beta-detectors, which is used to map the position-dependence of the beta detectors. Natural Ar is utilized to provide an absolute calibration of the cold neutron flux. ^{41}Ar has a half-life of 109 minutes and a strong gamma-ray line at 1294 keV. The gamma activity is measured using an HPGe detector, and, after correcting for the measured line efficiency and resonance production rates, provides the absolute cold neutron flux in the source volume. Details of the calibration procedures and characteristic results will be presented.

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