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A segmented ^{3}He ion chamber for n-spin rotation experiment[1]
D. LUO, Indiana Univ/IUCF, V. ZHUMABEKOVA, Al-Farabi Khazakh National Univ, K. GAN, A.K. OPPER, The George Washington Univ, B.E. CRAWFORD, Gettysburg College, C.D. BASS, J.M. DAWKINS, T.D. FINDLEY, J.C. HORTON, C.R. HUFFER, A.M. MICHERDZINSKA, M.G. SARSOUR, W.M. SNOW, Indiana Univ/IUCF, E.I. SHARAPOV, Joint Institution for Nuclear Research, Dubna, H.P. MUMM, J.S. NICO, NIST, D.M. MARKOFF, North Carolina Central Univ, P.R. HUFFMAN, North Carolina State Univ/TUNL, B.R. HECKEL, H.E. SWANSON, Univ of Washington — Searches for parity violation effects in few nucleon systems often require current-mode detectors. We describe a high efficiency ^{3}He/Ar ion chamber designed to operate in current mode at a CW cold n source, It uses ^{3}He to absorb the neutrons and Ar to limit the range of the ions from the n+^{3}He reaction. It is longitudinally partitioned to gain information on the n velocity spectrum and transversely segmented to monitor the spatial distribution of the n beam. We adjust the ^{3}He and Ar density to obtain an approximately even absorption of the beam in the 4 longitudinal partitions. A similar detector is described by Penn et al[1] and was tested at the LANSCE for possible use in the NPDγ experiment[2]. We will present details on the design and performance as measured on the NG6 beam at NIST. [1] S.D. Penn et al, Nucl. Instr. and Meth. A 457 (2001) 332-337. [2] C. Blessinger, PhD thesis, Indiana Univ. 2000

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