Abstract Submitted
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Precision measurement of ^{23}Al beta-decay[1] YONGJUN ZHAI, V.E. IACOB, J.C. HARDY, T. AL-ABDULLAH, A. BANU, C. FU, V.V. GOLOVKO, M. MCCLESKEY, N. NICA, H.I. PARK, G. TABACARU, R.E. TRIBBLE, L. TRACHE, Cyclotron Institute, Texas A&M University — The beta-decay of ^{23}Al (See [1]) was re-measured with higher statistics and better accuracy at Texas A&M University. Using MARS we produced and separated pure ^{23}Al at 4000 pps, with a 48 MeV/u ^{24}Mg beam via the ^{24}Mg (p, 2n)^{23}Al reaction on a H_2 cryogenic target. New β and $\beta-\gamma$ coincidence measurements were made with a scintillator, an HPGe detector with BGO shielding and the fast tape transport system. The BGO Compton shield very much improved the quality of the γ spectra around the transition from the IAS state at 7803 keV. From the measured β singles and $\beta-\gamma$ coincidence decay spectra we obtained an improved β-decay scheme and a more precise lifetime: t=447(4) ms. We use the method of detailed balance to obtain absolute β-branching ratios and absolute logft values for transitions to final states in ^{23}Mg. For this method, precise efficiency calibration of the HPGe detector up to about 8 MeV is needed. We extended our previous efficiency calibration to the range E_γ=3.5-8 MeV using the β-decay of ^{24}Al.
[1] V.E. Iacob, Y. Zhai et al., Phys. Rev. C 74, 045810 (2006).

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