Abstract Submitted
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Test of Internal-Conversion Theory with Precise γ- and x-ray Spectroscopy: ^{134}Cs^{m},^{137}Ba, ^{139}La N. NICA, J.C. HARDY, C. BALONEK, V.E. IACOB, J. GOODWIN, H.I. PARK, W.E. ROCKWELL, Texas A&M University, M.B. TRZHASKOVSKAYA, Petersburg Nucl. Phys. Inst. — We recently reported [1] a measurement of the ratio of K-shell internal conversion coefficients, α_K, for two transitions; the 127.5-keV $E3$ in ^{134}Cs and the 661.7-keV$M4$ in ^{137}Ba. Previous measurements of these α_K values disagreed with calculations. Our new result for the ratio, 30.01(15), disagrees with, but is a factor of three more precise than, the previous average of all experimental results and is consistent with modern Dirac-Fock calculations that include the atomic vacancy in the daughter. This confirms our earlier conclusion [2] that this approach is the best one for ^{193}Ir, a much heavier nucleus. In a new measurement we have now deduced the precise efficiency of our HPGe detector in the energy range of Cs-La K X-rays from the 165.9 keV,$M1$ transition in ^{139}La, for which the α_K value can be reliably calculated and is nearly independent of whether the atomic vacancy is included or not. Based on this calibration, we have converted our ratio result into individual α_K results for the transitions in ^{134}Cs and ^{137}Ba: viz. $\alpha_K(127.5)$=2.745(16) and $\alpha_K(661.7)$=0.0915(6). Both results are in good agreement with calculations that include the atomic vacancy. [1] N. Nica *et al.*, Phys. Rev. **C75**, 024308 (2007); [2] N. Nica *et al.*, Phys. Rev. **C70**, 054305 (2004).

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