

Abstract Submitted
for the DAMOP10 Meeting of
The American Physical Society

Effect of atomic electrons on 7.6 eV nuclear transition in $^{229}\text{Th}^{3+1}$
SERGEY PORSEV, UNSW & PNPI, VICTOR FLAMBAUM, UNSW — We have considered an effect of atomic electrons due to the electronic bridge process on the nuclear $^{229m}\text{Th} - ^{229g}\text{Th}$ transition in $^{229}\text{Th}^{3+}$. Based on a recent experimental result we assumed the energy difference between the isomeric and the ground nuclear states to be equal to 7.6 eV. We have calculated the ratios of the electronic bridge process probability (Γ_{EB}) to the probability of the nuclear radiative transition (Γ_N) for the electronic $5f_{5/2} \rightarrow 6d_{3/2}, 6d_{5/2}, 7s$ and the $7s \rightarrow 7p_{1/2}, 7p_{3/2}$ transitions and found $\Gamma_{\text{EB}}/\Gamma_N \sim 0.01 \div 0.1$ for the former and $\Gamma_{\text{EB}}/\Gamma_N \sim 20$ for the latter.

¹This work was supported by Australian Research Council. The work of S.P. was supported in part by the Russian Foundation for Basic Research under Grants No. 07-02-00210-a and No. 08-02-00460-a.

Sergey Porsev
UNSW and PNPI

Date submitted: 21 Jan 2010

Electronic form version 1.4