

Abstract Submitted  
for the MAR07 Meeting of  
The American Physical Society

**Design and characterization of a compact multi-detector gamma array for studies of induced gamma emission: spontaneous decay of  $^{178\text{m}2}\text{Hf}$  as a test case** P. UGOROWSKI, R. PROPRI, S.A. KARAMIAN, D. GOHLKE, J. LAZICH, N. CALDWELL, R.S. CHAKRAWARTHY, M. HELBA, H. ROBERTS, J.J. CARROLL — Recent scientific attention has focused on the m2 isomeric state of Hafnium,  $^{178\text{m}2}\text{Hf}$ . The spontaneous decay of  $^{178\text{m}2}\text{Hf}$  takes the form of a cascade of gamma photons, totaling 2.4 MeV of energy per nucleus, or approximately 1.3 GigaJoules/gram. If all the decays were simultaneous, exawatt ( $10^{18}$ ) energy outputs could be realized. A class of isomers called “K-isomers” has been studied to determine the possibility of xray-induced decay of the excited isomeric state. The purpose of the “miniball” detector system was to separate out possible induced cascades from the spontaneous decay cascades using nuclear calorimetry, in order to settle a recent scientific controversy involving claims of induced decay and counter-claims of null results.

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Date submitted: 08 Dec 2006

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