



DEFENSE ADVANCED RESEARCH PROJECTS AGENCY

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Dear TRIP Report Interested Party,

Please find attached the completed report on the TRiggered Isomer Proof test. The actual experiments were performed at the National Synchrotron Light Source (NSLS) at Brookhaven National Laboratory due to the unavailability of a beam line at the Advanced Light Source. The support provided at the NSLS was outstanding.

The report confirms the observation of the 129.4 keV transition in coincidence with the 213.4 keV transition in the Ground State Band (359 counts, 4.13 sigma) as predicted. The number of counts, 359, nearly doubled the predicted 200 counts, but the statistical significance 4.13 sigma was not as strong as the 12 sigma originally predicted. The main reason for this loss in significance was the weaker hafnium target required for the smaller spot size at the NSLS beam line.

One of the difficulties in analyzing the data turned out to be the strongest proof of prompt triggering to date. In considering **all** of the coincidences with the 213.4 keV and 93.2 keV transitions, it is very clear that the levels from which these transitions are fed, are populated by other than higher Ground State Band transitions when the synchrotron beam is turned on. These levels are then fed by transitions from above the 1147.4 keV (4 second isomer) level. This is the strongest proof yet that triggering occurs, it is prompt, and the path is different from the natural decay path. ***Triggered decays do not pass through the four second isomer state that leads to the Ground State Band in the natural isomeric decay.***

Thank you for your interest in this scientifically interesting problem. We are happy to answer questions. Please direct your questions to:

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Sincerely,

A handwritten signature in cursive script, reading "Robert Leheny".

Dr. Robert Leheny
Acting Director, DARPA/MTO