Abstract Submitted
for the HAW05 Meeting of
The American Physical Society

The Time of Flight Technique for Nuclear Lifetime Measurements AARON CHESTER, RYAN MCKENDREE, Michigan State University, KRZYSZTOF STAROSTA, WILHELM MUELLER, ANA BECERRIL, HEATHER OLLIVER, RUSS TERRY, CHRIS CAMPBELL, JON COOK, CRISTIAN DINCA, NSCL — The onset of deformation in even-even nuclei is known to be manifested by a decreasing energy of the 2^+ excited state, E (2^+), correlated with an increase in the associated reduced transition probability B(E2). It is surprising to observe for A$\geq^{110}$Pd nuclei that as E(2^+) decreases, so does B (E2). It is proposed to reinvestigate this trend using the time of flight technique, which is undergoing development at the NSCL. With this method, a fast beam of degraded nuclei of interest produced in a fragmentation reaction is Coulomb excited to the 2^+ state on a moveable target. A stationary degrader is positioned downstream to further slow the nuclei. Gamma-rays emitted during the de-excitation process before and after the degrader are measured at a different Doppler shift. The SeGA array of segmented germanium detectors is used for gamma-ray detection as it provides an optimal balance of sensitivity to changes in velocity and energy resolution. The ratio of intensities of the measured peaks yields information about the lifetime at the measured velocity. The results of a proof of principle experiment performed with the primary beam of ^{124}Xe will be presented.

Aaron Chester
Michigan State University

Date submitted: 18 Aug 2005 Electronic form version 1.4