HAW09-2009-000237

Abstract for an Invited Paper
for the HAW09 Meeting of
the American Physical Society

Nuclear transition moment measurements of neutron rich nuclei

KRZYSZTOF STAROSTA, Simon Fraser University

The Recoil Distance Method (RDM) and related Doppler Shift Attenuation Method (DSAM) are well-established tools for lifetime measurements following nuclear reactions near the Coulomb barrier. Recently, the RDM was implemented at National Superconducting Cyclotron Laboratory (NSCL) at Michigan State University using NSCL/Köln plunger device and a unique combination of the state-of-the-art instruments available there. Doppler-shift lifetime measurements following Coulomb excitation, knock-out, and fragmentation at intermediate energies of $\sim$100 MeV/u hold the promise of providing lifetime information for excited states in a wide range of unstable nuclei. So far, the method was used to investigate the collectivity of the neutron-rich ^{16,18,20}C, ^{62,64,66}Fe, ^{70,72}Ni, ^{110,114}Pd isotopes and also of the neutron-deficient N=Z ^{64}Ge. A significant fraction of these experiments was performed using NSCL's Segmented Germanium Array instrumented with the Digital Data Acquisition System which enables gamma-ray tracking. The impact of GRETINA and gamma-ray tracking on RDM and DSAM studies of neutron-rich nuclei will be discussed.