Nuclear Structure Research at the Holifield Facility *

Cyrus Baktash

Physics Division, Oak Ridge National Laboratory, Oak Ridge, TN 37831-6371, USA

Since the early Eighties, the tandem at the Holifield Facility has been the world's largest electrostatic accelerator, capable of delivering heavy ions (A~150) up to the Coulomb barrier for nuclear structure research. The combination of these beams and a number of unique detector systems (such as the Spin Spectrometer, the CSS Ge array, and the Miniball) allowed, for the first time, detailed studies of evolution of nuclear structure as a function of spin and temperature. This talk will review some of the highlights of these studies, including:

- Discovery of the band termination in heavy nuclei,
- Extensive lifetime measurements at high spins that showed loss of collectivity and "nuclear shrinkage" at large rotational frequencies,
- Studies of nuclear Josephson effect in heavy-ion transfer reactions,
- Gamma spectroscopy of neutron rich nuclei produced in spontaneous fission of transactinides,
- Characterization of alignment effects in A~180 nuclei and observation of Pseudo-Spin doublets in ^{175}Re,
- Observation of identical bands in odd-even Hf isotopes that triggered a wider search for this phenomenon in normally-deformed nuclei,
- High-fold continuum gamma ray spectroscopy and first quantitative studies of the evolution of the rotational damping with spin and temperature,
- First detailed studies of shape evolution in a transitional nucleus (^{158}Yb) that demonstrated survival of shell effects and collectivity at high excitation energies.

Time permitting, an outline of future nuclear structure studies at the HRIBF with radioactive ion beams will also be presented.

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*Research at the Oak Ridge National Laboratory is sponsored by the U.S. Department of Energy under contract DE-AC05-00OR22725 with UT-Battelle, LLC.