RECENT DEVELOPMENTS IN SHAPE COEXISTENCE STUDIES

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The information on collective properties of nuclei far from stability, in particular on the neutron-rich side of the valley of stability, has dramatically improved in recent years due to the availability of reaccelerated radioactive ion beams used, e.g., for Coulomb excitation studies and the application of lifetime measurements, such as the RDDS technique, to reaction mechanisms suitable for producing neutron-rich nuclei, e.g., multi-nucleon transfer and fusion fission reactions.

Over the last few years we have carried out a research program using these complementary techniques, and applied them, e.g., to neutron-rich nuclei in the A~100 region. In particular the evolution of nuclear shapes beyond the onset of strong deformation at N=60 (in particular in Sr and Zr isotopes) as well as the importance of the triaxial degree of freedom in the Mo and Ru isotopes at N~64-70 are of strong current interest.

In this presentation recent results will be presented that were obtained in this mass region at several different facilities. Using heavy-ion induced fission at GANIL and the VAMOS and EXOGAM spectrometers, lifetime measurements were for the first time performed on event-by-event identified fission fragments, yielding new results in several Zr, Mo, Ru and Pd isotopes. Using radioactive Sr, Zr, Mo and Ru beams from the CERN-ISOLDE and ANL-CARIBU facilities, Coulomb excitation was performed yielding electro-magnetic matrix elements, being directly sensitive to nuclear shapes.

This material is presented on behalf of several different international collaborations based at ANL, CERN-ISOLDE and GANIL making use of spectrometers built in large international collaborations, such as EXOGAM, GRETINA, MINIBALL and VAMOS.