Sub-Barrier Coulomb Excitation of ^{110}Sn and First Results on ^{108,106}Sn

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The advent of radioactive ion beams (RIBs) places exotic nuclei within reach of experimental study. In particular, RIBs enables a new investigation of the low energy structure of isotopes in the vicinity of the doubly magic ^{100}Sn nucleus. We present here the first results from a series of measurements of the reduced transition probability - the $B(E2)$ value - for the neutron deficient Sn-isototpes ^{110,108,106}Sn [1]. All three experiments were performed using sub-barrier Coulomb excitation at 2.8 MeV/u at REX-ISOLDE with the MINIBALL germanium detector array. This technique provides a measurement accuracy of $\sim 10\%$. The $B(E2)$ value can presently not be obtained using any other method, due to a high lying 6^+ isomer present in the neutron-defiecient even Sn isotopes.

Doubly-magic nuclei are of significant theoretical importance, since they provide a good testing ground for shell-model calculations. The Sn isotopic chain comprises nuclei between neutron numbers N=82 and N=50. Therefore it provides a unique opportunity to study the shell structure evolution as a function of the neutron degree of freedom. The spectroscopy of the low lying states in the even Sn isotopes have been explained within the generalized seniority scheme [2]. Large scale shell model calculations using a model space confining the neutrons to the *gdsh* orbitals support this picture [3]. Our recent experiments together with results from refs. [3,4] indicate a deviation from theoretical predictions manifested in a stronger than expected collectivity towards the proton dripline. This might imply that further core-polarization effects and a refined effective interaction are needed. One perhaps important effect recently discussed in refs. [5,6,7] is that of an enhanced attractive neutron-proton interaction in spin- isospin-flip vertices contained in the monopole part of the tensor force. Hence, with a decrease of neutrons in the orbital $0g_{7/2}$, the proton $0g_{9/2}$ becomes less bound, implying an increased core-excitation probability. Thus, this effect could compete with a reduction of the B(E2) values originating in the decrease in neutron number. We will present the latest results and data analysis from ^{110,108,106}Sn, and where they stand in comparison with present theoretical models.

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