Coulomb Excitation of ^{110}Sn using REX-ISOLDE

J. Cederkall[1,2], A. Ekstrom[2], A. Hurst[3], C. Fahlander[1], A. Banu[4], P. Butler[3], J. Eberth[5], M. Gorska[4], D. Habs[6], M. Huyse[7], O. Kester[6], O. Niedermayer[8], T. Nilsson[9], M. Pantea[9], H. Scheit[8], D. Schwalm[8], G. Sletten[10], D. P. Ushasi[11], P. van Duppen[7], N.Warr[5], D.Weisshaar[5] and J. Iwanicki[12] for the IS418 and REX-ISOLDE collaborations

[1]Lund University, Lund, Sweden,
[2] PH Department, CERN, Geneve 23, Switzerland,
[3]Liverpool University, Liverpool, UK,
[4] GSI, Darmstadt, Germany,
[5] University of Cologne, Cologne, Germany,
[6] Ludwig Maximilian's University, Munich, Germany,
[7] Catholic University, Leuven, Belgium,
[8]MPI-K, Heidelberg, Germany,
[9]TU-Darmstadt, Darmstadt, Germany,
[10] University of Copenhagen, Copenhagen, Denmark,
[11] Saha Institute of Nuclear Physics, Kolkata, India,
[12] HIL, Warsaw, Poland

The evolution of nuclear shell structure away from stability is one of several topics that drive the development of post-accelerated radioactive beams. In particular the structure close to the double shell closure at ^{100}Sn has been a hot topic for several years. The aim of the current experiment has been to continue a series of measurements we have carried out using fusion-evaporation reactions over the past few years but now to address some questions that cannot be answered using more traditional approaches. In particular the aim of the experiments discussed here is to measure the reduced transition probability B(E2) of neutron deficient even-even Sn-isotopes by means of safe Coulomb excitation using the REX-ISOLDE facility at CERN. In this presentation we give the result from our first run with a ^{110}Sn radioactive beam as well a preliminary discussion of the experiments that are planned for ^{108}Sn and ^{106}Sn during 2006.

Coulomb excitation is a particularly advantageous technique in the case of the neutron deficient even Sn isotopes since a specific feature of these is an isomeric 6^+ state that hampers measurements of the lifetime of the first excited 2^+ state using other methods. The radioactive beam was produced by bombarding a thick primary target consisting of lanthanum carbide with high energy protons, coming from the CERN PS Booster. After some initial preparation the beam was post-accelerated to 2.82 MeV/u in the REX post-accelerator. Intensities of up to 10^8p/s could be reached at the secondary target. The scattered Coulomb excited nuclei and their accompanying de-excitation γ-rays were detected in the MINIBALL detector system. The principle behind the experiment, the analysis of the data and the result will be discussed.