Contribution ID: **4** Type: **not specified**

Coulomb excitation of neutron-deficient radon isotopes

Friday 25 October 2013 11:10 (20 minutes)

The region of proton rich nuclei close to Z=82 is well known for shape coexistence with competition between different spherical, oblate and prolate minima. Data on the light radon nuclei e.g. 198-206Rn is rather limited and largely restricted to information on near-yrast states as inferred from in-beam studies. These studies seem to indicate a change from a largely vibrational behaviour around 212Rn to the onset of deformation around 198Rn. The level schemes are complex and much information is missing.

In order to obtain more detailed information on collectivity in these nuclei, an experiment was performed at REX-ISOLDE to carry out Coulomb excitation of 202Rn and 204Rn. At the time of the experiment, these were the heaviest ISOL beams ever accelerated. The choice of radon nuclei was motivated both by the underlying Physics but also the ability to produce pure, intense beams of these isotopes using a cooled transfer line to remove isobaric contamination. The analysis of the data obtained has been completed and the data have been used to extract matrix elements using the Coulomb excitation code, GOSIA.

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Session Classification: Status of ongoing MINIBALL experiments Part II