



Contribution ID: 8

Type: **Presentation**

Employing proton knock-out to produce and study neutron unbound nuclei: ^{13}Be and ^{16}B

Thursday, 3 July 2014 11:25 (25 minutes)

Unbound nuclei, at the border between bound nuclear systems and the continuum, offer a unique way to increase understanding of the nuclear interaction. Radioactive ion beams at high energies provide the possibility to create and study unbound nuclei using e.g. knock-out reactions. These reactions imply little interaction with the spectator part of the nucleus and are thus a versatile tool for spectroscopy.

The present work is based on an experiment performed in 2010 using the LAND/R3B setup at GSI. Secondary beams with an energy around 450 AMeV in the $Z = 4$ to $Z = 10$ region were employed. This multipurpose experiment aimed not only at the study of unbound nuclei using proton knock-out reactions but also on single-particle spectroscopic factors, the shell structure of neutron rich nuclei and (n,γ) -rates of astrophysical relevance in this region of the nuclear chart.

The LAND/R3B setup allows for event-by-event detection in complete kinematics having an almost 4 acceptance due to the relativistic forward-focusing of the reaction-products. It is therefore ideal for studying unbound nuclei using proton knock-out reactions. In particular the unbound nuclei ^{16}B and ^{13}Be , produced by proton knock-out from ^{17}C and ^{14}B respectively, are the subject of this work.

The relative energy of the bound core + neutron systems is studied as well as their gamma-spectra, yielding information about the orbital momenta of the unbound systems.

Primary author: Ms THIES, Ronja (Chalmers University of Technology)

Co-author: Mr RIBEIRO, Guillermo (CSIC-IEM)

Presenter: Ms THIES, Ronja (Chalmers University of Technology)

Session Classification: Session 8

Track Classification: Prefer Presentation