

## Future Perspectives with R3B

*Monday, 8 June 2015 17:00 (30 minutes)*

The R3B (Reactions with Relativistic Radioactive Beams) experiment at FAIR will enable kinematically complete measurements of reactions with relativistic beams up to energies of approximately 1 AGeV. In this contribution I will focus on the investigation of dipole response of exotic nuclei using the precursor of R3B, named ALADIN-LAND or R3B-LAND setup, the transition from this setup to the R3B setup at GSI and the future possibilities using the fully equipped R3B experiment at the FAIR facility.

The dipole response of exotic nuclei can be ideally studied using Coulomb excitation in inverse kinematics, enabling the investigation of excitation energies spanning the pygmy (PDR) and giant dipole resonance (GDR). The electric dipole polarizability  $\alpha_D$ , being very sensitive to the low-lying dipole strength, is correlated to the neutron skin thickness in a robust and less model-dependent manner [1]. Recently, for the stable nucleus,  $^{208}\text{Pb}$  the neutron skin thickness was extracted from the measured  $\alpha_D$  [2].

Here, a first experimental determination of the electric dipole polarizability  $\alpha_D$  in an unstable nucleus, namely  $^{68}\text{Ni}$ , and the derivation of its neutron-skin thickness will be reported [3].

[1] P.-G. Reinhard and W. Nazarewicz, Phys. Rev. C 81, 051303 (2010).

[2] A. Tamii et al., Phys. Rev. Lett. 107, 062502 (2011).

[3] D. Rossi et al., Phys. Rev. Lett. 111, 242503 (2013).

**Primary author:** Dr BORETZKY, Konstanze (GSI Darmstadt)

**Presenter:** Dr BORETZKY, Konstanze (GSI Darmstadt)

**Session Classification:** At and beyond the dripline and new modes of radioactivity

**Track Classification:** At and beyond the dripline and new modes of radioactivity