

---

# EXPERIMENTAL STUDIES OF PDR AND GDR IN EXOTIC NUCLEI

Konstanze Boretzky, GSI Darmstadt, Germany

---

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]. The extend of model-dependency for these kind of correlations is under discussion, e.g. as detailed by X. Roca-Maza [3].

Here, a first experimental determination of the electric dipole polarizability  $\alpha_D$  in an unstable nucleus, namely  $^{68}\text{Ni}$ , will be reported [4].

The results comprise in addition the resonance parameters for the observed PDR at 9.55(17) MeV and the GDR at 17.1(2) MeV. In combination with the results from Wieland et al. [5] an unexpectedly large direct photon-decay branching ratio of 7(2)% is observed for the PDR.

Future experimental possibilities to study the dipole response of exotic nuclei will be discussed.

## REFERENCES

- [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] X. Roca-Maza, et al., PRC 88, 024316 (2013)
- [4] D. Rossi et al., Phys. Rev. Lett. 111, 242503 (2013).
- [5] O. Wieland et al., Phys. Rev. Lett. 102, 092502 (2009).