Contribution ID: **49** Type: **Oral**

# Study of quadrupole collectivity in neutron-rich 128Cd

*Monday, 21 May 2012 12:40 (20 minutes)*

The neutron-rich isotope 128Cd is only two proton and two neutron holes away from the doubly-magic nucleus 132Sn. It is famous for the irregular behaviour of the excitation energy of the first 2+ state, a feature which cannot be explained even by recent shell model calculations. Currently, only a beyond-mean-field approach is capable to reproduce the anomaly. However, it predicts a considerable prolate deformation next to the N=82 shell closure. Astrophysical interest in this particular isotope arises from the proximity to the r-process waiting-point nucleus 130Cd.

We investigated the exotic isotope 128Cd for the first time by safe Coulomb excitation. The beam was delivered at an energy of about 2.85 MeV/u by the REX-ISOLDE facility at CERN. Scattered beam particles as well as recoiling target nuclei were detected by a segmented Si detector in coincidence with gamma-rays measured by the MINIBALL array. From the differential excitation cross section electric matrix elements were deduced. In previous experiments, the isotopes 122,124,126Cd have been investigated in a similar way and evidence for a larger quadrupole collectivity compared to predictions from the shell model has been found. Additionally, the isotope 126Cd has been studied in a lifetime measurement employing the Doppler shift attenuation method (DSAM).

In this contribution we will present first new results for 126,128Cd and discuss the evolution of the quadrupole collectivity along the Cd isotopic chain towards N=82.

This work is supported by BMBF (No. 06DA9036I), EU through ENSAR (No. 262010), HIC for FAIR, and the MINIBALL and REX-ISOLDE collaborations.

**Primary author:** Prof. KRÖLL, Thorsten (TU Darmstadt)

**Co-authors:** Dr SCHECK, Marcus (TU Darmstadt); Mr THÜRAUF, Michael (TU Darmstadt); Mr VON SCHMID, Mirko (TU Darmstadt); Ms BÖNIG, Sabine (TU Darmstadt); Dr ILIEVA, Stoyanka (TU Darmstadt); Mr BLOCH, Timo (TU Darmstadt)

**Presenter:** Prof. KRÖLL, Thorsten (TU Darmstadt)

**Session Classification:** Nuclear Structure far from Stability

**Track Classification:** Nuclear structure far from stability