



Contribution ID: 61

Type: **Poster presentation**

Nuclear Resonance Fluorescence on ^{106}Pd

This study aims at understanding the dependence of the E1 strength in the transition region from vibrational to rotational nuclei. The chosen method of study is the Nuclear Resonance Fluorescence method, a two-step photonuclear process which consists of the absorption of a photon and the subsequent resonant re-emission of gamma rays.

The experimental data has been acquired using the DHIPS (Darmstadt High-Intensity Photon Source) setup at the S-DALINAC facility, in Darmstadt, Germany. A monoenergetic electron beam impinging on two Ag bremsstrahlung targets (1mm and 5 mm thickness) and creating bremsstrahlung radiation with an end-point energy of 8.7 MeV and a current of 40 μA was employed. An array of three high-purity Germanium (HPGe) detectors, positioned at 130° and two at 90° with respect to the incoming beam, was employed. The detectors were equipped with bismuth germanate (BGO) shields for active Compton suppression and additionally mounted in lead collimators. The primary target consists of 0.991 g of ^{106}Pd that was placed in between the three detectors.

This first measurement in ^{106}Pd uncovered new transitions in the 4-8 MeV energy range. The data will be analyzed and will provide an overview of the γ -ray transition energies, photon strength functions, integrated cross-sections, spin-parity assignments and branching ratios.

- This work was supported by Project ELI-RO/DFG/2023_001 ARNPhot funded by the Institute of Atomic Physics, Romania and by the Deutsche Forschungsgemeinschaft (DFG, German Research Foundation) –Project-ID 499256822 –GRK 2891 ‘Nuclear Photonics’.

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Session Classification: Poster Session