SELECTIVE EXCITATION OF THE PYGMY DIPOLE RESONANCE IN ^{120}SN VIA THE (d,pγ) REACTION

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The excitation of states belonging to the Pygmy Dipole Resonance (PDR) in ^{120}Sn was investigated by means of a single-neutron transfer-reaction. A ^{119}Sn(d,pγ) experiment was performed, using the combined setup SONIC@HORUS at the 10 MV FN Tandem accelerator in Cologne. The setup, consisting of 14 HPGe and 6 ΔE-E silicon telescope detectors for the coincident detection of γ-rays and charged particles, allows an offline selection of excitation and deexcitation channels. The analysis shows a clear excitation of states in the PDR region, i.e., from 5 to 9 MeV. Several states in this region were identified as J=1 states by comparison to data from a Nuclear Resonance Fluorescence (NRF) experiment [1]. Since emitted protons and γ-rays were detected in coincidence, individual branching ratios could be determined, shedding more light on the internal structure of the PDR.

As neutron-transfer reactions are very sensitive probes for 1p1h neutron-excitations, the comparison of experiments employing different reaction mechanisms [1,2] can give deeper insight into the collectivity and single-particle character of the PDR.

This contribution will present the (d,pγ) experiment and all observables which could be determined, focusing on branching ratios and their influence on the B(E1) strength. Furthermore, results will be put into context by comparison to data from other experiments, i.e., NRF and (p,p') experiments.

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REFERENCES

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