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Study of the K quantum number of pygmy states in 154Sm

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This work investigates the Pygmy Dipole Resonance (PDR) in the deformed ^{154}Sm nucleus. The study uses the $(\vec{\gamma},\vec{\gamma}')$ reaction to excite dipole states at energies ranging from 3.5 MeV to 7.05 MeV, approaching the neutron separation energy at 8 MeV. Measurements were taken with the Clover Array at the HIγS facility of the Triangle Universities Nuclear Laboratory. The facility's polarised photon beam enables measurements using the asymmetry method to distinguish between 1^- and 1^+ states. The high-resolution beam mode (with an energy spread below 2%) allows for the determination of decay branching ratios to the first 2^+ state thereby enabling the identification of the K quantum number for the excited states. Additionally, the current study extends the investigation of the Alaga rules to the PDR region of ^{154}Sm, as they have so far only been investigated for ^{150}Nd[1]. We provide preliminary results and discuss prospects for future analysis.

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References

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