GYROMAGNETIC RATIOS IN STABLE AND NEUTRON-RICH SEMI-MAGIC NUCLEI BY THE RECOIL IN VACUUM METHOD

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Several theoretical approaches have predicted the g factors of 2_1^+ states in the semimagic Sn isotopes, and in neutron-rich Te isotopes near ^{132}Sn [1, 2]. However, the experimental data have remained incomplete. In this paper we present new g-factor measurements by the recoil in vacuum (RIV) method [3], systematically covering the stable even tin isotopes between ^{112}Sn and ^{124}Sn, and neutron-rich ^{126}Sn. Tellurium isotopes, including semimagic ^{134}Te produced as a radioactive beam, have also been studied. The experiments were performed at the Holifield Radioactive Ion Beam Facility (HRIBF) by Coulomb exciting ~ 3 MeV/u beams in inverse kinematics on carbon targets, and using the CLARION+HyBall arrays to observe the perturbed particle-γ angular correlations. The measurements on the radioactive beam of ^{134}Te have sufficient precision to distinguish between the model calculations, which predict $g(2_1^+)$ values ranging from 0.5 to 0.86 [1].

To establish the requirements for future measurements on neutron-rich Ni isotopes, the RIV method has also been applied to 1.8 MeV/u ^{62}Ni beams, for which $g(2_1^+)$ is known.

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References

[1] J. Terasaki *et al.*, Phys. Rev. C **66**, 054313 (2002);
N. Shimizu *et al.*, Phys. Rev. C **70**, 054313 (2004);
B. A. Brown *et al.*, Phys. Rev. C **71**, 044317 (2005).

[2] A. Ansari, P. Ring, Phys. Lett. **B 649**, 128 (2007).

[3] N. J. Stone *et al.*, Phys. Rev. Lett. **94**, 192501 (2005).