Elastic Magnetic Electron Scattering from odd-A Nuclei

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Electron scattering is a powerful tool for studying the electromagnetic properties of nuclei. This process is not only sensitive to the well known nuclear charge distribution, but also to the convection and magnetization nuclear current distributions. Whereas the collective aspects dominate the charge scattering, the magnetic scattering mainly provides information on the single-particle properties of both protons and neutrons [1]. We study in this work magnetic form factors corresponding to elastic electron scattering from odd-A nuclei. The calculations are carried out in plane-wave Born approximation. The one-body properties are obtained in a deformed self-consistent mean-field calculation based on a Skyrme HF+BCS method. Results on several stable nuclei are compared with the available experimental information. It is shown that a deformed formalism [2] improves the agreement with experiment in deformed nuclei, while reproducing equally well spherical nuclei by taking properly the spherical limit of the deformed model and the effect of nucleon-nucleon correlations. Thus, the capability of the model to describe magnetic form factors is demonstrated [3]. This opens the door to explore also unstable nuclei of particular interest that could be measured in future experiments on electron-radioactive beam colliders [4].

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