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Nuclear structure via Coulomb excitation

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Coulomb excitation is a well-established and powerful experimental technique for probing the structure and dynamics of nuclei in a model-independent way. The technique is especially sensitive to the quadrupole shape degrees of freedom as it selectively excites low-lying collective states with cross sections that directly measure the E2 matrix elements involved in the excitation. In particular, the technique allows the determination of transitional and diagonal E2 matrix elements between low-lying states, the most direct and unambiguous measure of the collective shape parameters. In addition, the technique provides unique and model-independent information on the relative signs of the diagonal E2 matrix elements, thus allowing a link between reduced transition probabilities and spectroscopic quadrupole moments and the β,γ shape parameters of the Bohr Hamiltonian. In this presentation, I will explain the principles and applications of Coulomb excitation as a tool for exploring quadrupole collectivity in nuclei. I will also briefly review the theoretical framework of Coulomb excitation, describe experimental setups and methods, and present recent studies that illustrate its contribution to our understanding of shape dynamics in neutron-rich nuclei.

Attendance Type

In-person

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