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Investigation of low-lying nuclear structure in stable Zn-isotopes

A series of multi-step coulomb excitation experiments were carried out at GDA laboratory of IUAC New Delhi in order to investigate the low-lying electromagnetic nuclear structure of $^{64,68,70}\text{Zn}$ nuclei, wherein the available information is rather diluted. The reduced transition strength $B(E2; 4_1^+ \rightarrow 2_1^+)$ and $B(E2; 2_1^+ \rightarrow 0_1^+)$ in few Zn-isotopes shows a larger discrepancy among the results obtained from different experimental techniques using RDDS and DSAM methods of finding lifetime of a state and hence the transition probabilities. Similarly the spectroscopic quadrupole moment of 2_1^+ in ^{68}Zn is negative in an electron scattering experiment while it is positive from another multi-step Coulomb excitation experiment, which is apparently contradictory. Some previous studies have shown that the low-lying nuclear structure of Zn-isotopes is not as straightforward as is portrayed in the level-structure diagram. Coulomb excitation has the advantage of studying the low-lying structure model-independently and devoid of uncertainties that afflict many other spectroscopic probes.

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