

Search for E0 transitions in even-even ^{54}Cr and odd-odd ^{54}Mn nuclei

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Between ^{40}Ca and ^{56}Ni , the most dominant physical feature emerging is super-deformation [1] and the open question that is yet to be answered with experimental evidence is, does the super-deformation follow through to ^{56}Ni . There are also strong evidence from theoretical predictions that shape coexistence exist along the chain of $N = 28$ isotones, amid ^{56}Ni and ^{48}Ca [2, 3] as it is believed to exist throughout the nuclear chart [4]. Nevertheless, there is no experimental data available on E0 transitions in ^{50}Ti and in neighbouring ^{52}Ti , ^{54}Cr , and ^{54}Mn . In this study, the E0 strength which carry vital information about the nuclear structure have been determined in the and transitions of ^{54}Mn for the first time, utilising pair and conversion-electron spectroscopy.

1. E. Ideguchi, et al., Phys. Rev. Lett. 87 (2001) 22
2. K. Heyde and J.L. Wood. Rev. Mod. Phys. 83 (2011) 1466-1478
3. G. Saxena and M. Kaushik. Jour. of Maths. and Phys. 3 (2017) 356-359
4. J.L. Wood et al., Nucl. Phys. A 651 (1999) 323-368

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Session Classification: Nuclear Structure Studies

Track Classification: Nuclear Structure Studies