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Investigating cluster configurations with the K600

Isoscalar monopole and dipole excitations have been identified as powerful probes of clustering behaviour in nuclei. Both types of transitions are associated with cluster configurations, the dipole transitions are the parity-doublet structures and only occur for asymmetric cluster configurations. Antisymmetrised molecular dynamics calculations predict not only the excitation energies but also the transition strengths to the excited monopole and dipole states.

In recent years, a wealth of data have been taken with the K600 to investigate isoscalar monopole and dipole transitions using the α -particle inelastic scattering reaction to test these predictions of cluster behaviour. The results of three recent K600 experiments will be discussed in this talk including a coincidence experiment investigating charged-particle decays from ^{24}Mg .

Future experiments investigating the observed low-lying isoscalar dipole transitions in rare-earth nuclei, which have been tentatively linked to α -particle cluster configurations will be briefly introduced.

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