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Electric monopole transitions in ^{74}Se

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The subject of this presentation is a measurement of internal conversion electrons aimed to study the structure of the low-lying states in ^{74}Se .

Electric monopole (E0) transitions are determined by a change in the radial distribution of the electric charge inside the nucleus, and high E0 transition strengths are expected whenever configurations with different mean-square charge radii mix.

In this regard, an enhancement of the monopole strength in transitions between states with $J=0$ may be considered as a “signature” for shape coexistence.

Despite their importance, the number of E0 transition strengths that have been measured experimentally is very limited. This deficiency is primarily due to the often complex nature of the required measurements and the necessity for electron spectroscopy which can be hindered by many sources of background. There is especially a lack of data for E0 transition strengths in $J \rightarrow J, J > 0$ transitions for example for $2^+ \rightarrow 2^+$ cases.

The levels of interest of ^{74}Se were populated following the decay of the ^{74}Br isotope. Measurements of E0 strengths for transitions between the first excited 0^+ states and 2^+ states in ^{74}Se have been achieved. A really large value for the $\rho^2(2_2^+ \rightarrow 2_1^+)$ has been extracted. A similar unexpectedly large values for the $\rho^2(2^+ \rightarrow 2^+)$ have been extracted some years ago in the neighboring Ni isotopes.

Thanks to the internal conversion coefficients we were able also to assign some level parities.

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