

Electric Monopole Transitions (E0) in the study of ^{70}Ge

Wednesday, 20 March 2019 10:30 (15 minutes)

Monopole transition studies has been of theoretical and experimental interest for over 50 years now. Since gamma decay is forbidden between two 0^+ states, the study of nuclear structure through the usual technique of gamma measurement cannot be useful in such a case. Hence, the decay mode of spin zero state is most probable by electron emission. Depending on the probable transition energies, this can be achieved through either internal conversion or by internal pair formation. Therefore, measurement of electrons is crucial for E0 studies.

In order to implement E0 studies at iThemba labs, an electron spectrometer has been refurbished and characterised using calibration sources of internal conversion electrons (ICE): ^{133}Ba and ^{207}Bi . The results of the spectrometer characteristics are described. The spectrometer coupled with an array of fast timing detectors and Low energy photon spectrometer (LEPS) was successfully implemented for in-beam experiment.

Preliminary result will be presented for the measured conversion coefficient and monopole strength parameter in ^{72}Ge and ^{72}Se determined from electron-gamma coincident experiments from $^{70}\text{Ge}(\alpha, \alpha')$ reaction.

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Session Classification: Nuclear Structure Studies

Track Classification: Nuclear Structure Studies