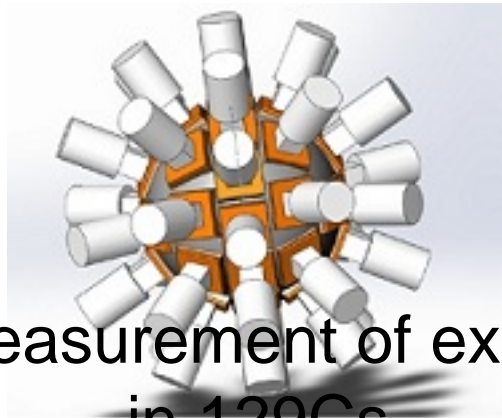


Frontiers in Gamma Ray Spectroscopy

FIG18

Contribution ID : 45



Lifetime measurement of excited states in ^{129}Cs

Content :

Doppler shift attenuation method is a modern technique to measure the nuclear lifetimes in picosecond range. However, the data analysis and results depend very sensitively on the various input parameters. The statistical quality of the data also plays an important role. Therefore, it is a challenge to obtain the accurate results. We populated the high spin states of ^{129}Cs using heavy ion fusion evaporation reaction $^{124}\text{Sn}(^{11}\text{B}, 6n)^{129}\text{Cs}$ at 70 MeV beam energy delivered by the Linac-Pelletron facility at TIFR. An enriched, self-supporting ^{124}Sn target (thickness 2.2 mg/cm²) was used. The isotope ^{129}Cs was intensely populated, so we could observe the Doppler lineshapes for many transitions belonging to two bands. These bands were already established by Sihotra et al. [1]. We constructed three E_y-E_y matrices corresponding to detector angles at forward (23°), backward (157°) and 90°. Different energy gates were set on these matrices. We observed many Doppler lineshapes. Earlier, Wang et al. [2] have already quoted the lifetime values for some excited states. From our preliminary data analysis, we obtained an approximate new lifetime value (2.4 ps) for the state 11/2⁺ which was not reported earlier. The lineshape fitting for many more gamma transitions is currently being carried out which will be presented.

[1] S. Sihotra et al., Phys. Rev. C 79, 044317 (2009).

[2] Wang Lie-Lin et al., Chin. Phys. Lett. 27, No.2, 022101 (2010).

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