# GDR STUDIES IN $^{28}Si + ^{124}Sn$ AT E*~71 MeV

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Giant Dipole Resonance (GDR) is a powerful tool for studying the average nuclear shape at high temperature (*T*) and angular momentum (*J*) [1]. In particular the variation of the GDR width ($\Gamma_D$) as a function of *T* and *J*, still remains a challenge. Although the Thermal Shape Fluctuation Model (TSFM), based on inhomogeneous damping is successfully able to describe the variation of GDR width with *T* and *J* in medium mass region, some discrepancies have been observed in $A \sim 150$ mass region [2]. It has been reported in ref. [3] that in addition to inhomogeneous damping, the contributions from intrinsic damping needs to be included to describe the observed *T*- and *J*-dependence of the GDR width in $^{28}Si + ^{124}Sn$ system at 149 MeV and 185 MeV. The intrinsic damping process is expected to have a steep *T* dependence. Therefore, study of the GDR in the same compound nucleus $^{152}Gd$ at lower excitation energy will provide insight into the *T*- dependence of the GDR damping mechanism. With this motivation, the experiment was carried out using 135 MeV pulsed $^{28}Si$ beam from PLF at Mumbai, bombarding an enriched 2.0 mg/cm$^2$ thick $^{124}Sn$ target producing $^{152}Gd$ at E* ~ 71 MeV and <J> ~ 26ħ. High energy γ-rays were detected with an array of seven close-packed hexagonal $BaF_2$ detectors, surrounded by cylindrical plastic detector for cosmic veto [3]. The angular momentum information is extracted using the multiplicity detector array consisting of 38 hexagonal BGO detectors configured in two equal close-packed groups placed above and below the target chamber. The n-γ discrimination was done using time of flight. Data were recorded for 0.1 pmC of incident beam particles using CAMAC based acquisition system LAMPS [4]. The background contributions were carefully monitored with blank target. In addition, high energy γ-ray spectra from 20 μg/cm$^2$ thick $^{12}C$ target was recorded separately to assess the contribution coming from the Carbon impurity in $^{124}Sn$ target. The extraction of GDR parameters using statistical model analysis is in progress and results will be presented.

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