STUDY OF GIANT DIPOLE RESONANCE DECAY FROM HOT ROTATING ^{132}Ce NUCLEUS

I.MAZUMDAR, J.J.DAS, D.O.KATARIA, N.MADHAVAN, P.SUGATHAN AND A.K.SINHA

NUCLEAR SCIENCE CENTRE, POST BOX 10502, NEW DELHI-110067, INDIA

It is now a well established fact that giant dipole resonance decay from excited nuclei is a very useful probe to study the dynamics of hot rotating nuclei.At Nuclear Science Centre , New Delhi we have initiated a programme to carry out systematic study of the GDR decay from several nuclei of mass 130 region.Nuclei in this region notably ^{132}Ce,^{133,135,137}Nd etc. have large prolate deformation at ground state and are expected to undergo shape phase transitions with temperature and spin.Sophisticated theoretical calculations have predicted such phase transitions in these nuclei.Superdeformed bands with very large feeding fractions have been found in all these above mentioned nuclei.This further provides exciting possibilities of observing a GDR state built on such SD state.

The ^{132}Ce nucleus was populated by bombarding a 3mg/cm^2 self supporting enriched ^{100}Mo target with pulsed beam of ^{32}S from the NSC 15UD tandem accelerator.The compound nucleus was produced at a beam energy of 140 MeV corresponding to about 60MeV of excitation energy.The high energy gamma rays were detected in the large high energy gamma ray spectrometer with plastic anticoincidence shield,recently set up at NSC,New Delhi.A 14 element BGO multiplicity filter was also used to study the effect of angular momentum on the GDR decay.The anticoincidence shield was used to veto the cosmic ray induced events and the escape radiation from the detector.Neutrons were discriminated from γ rays by TOF and the pile up events were also detected by zero crossover technique.The final corrected spectrum was obtained and a detailed analysis is in progress.The gamma ray spectrum as obtained by statistical model calculations are folded with the response function of the detector to match with the experimental results.The results will be reported in this conference.