INVESTIGATING PROLATE-OBLATE SHAPE INVERSION IN PT NUCLEI NEAR A ~ 188

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The nuclei in mass region A ~ 190 are well known for the prolate-oblate shape co-existence/ transition phenomena. The shape coexistence phenomena has been observed in nuclei like Hg & Tl of this mass region [1]. The calculations done for Pt nuclei in [2] indicate a smooth shape change from prolate deformed ^{186}Pt to nearly spherical $^{202\text{-}204}$Pt through the region of triaxially deformed $^{188\text{-}198}$Pt and slightly oblate ^{200}Pt. In these calculations, a change of shape from prolate to oblate is expected at A = 188. In recent high spin spectroscopic investigations, significant amount of reduced prolate collectivity has been observed in ^{188}Pt [3]. The level lifetimes provide valuable information about the nuclear shape and also the shape change with increase in spin along a band. So, to get clear signature of prolate to oblate shape inversion in Pt nuclei near A = 190, it is required to perform lifetime measurements. With this objective, an RDM lifetime measurements of the high spin states in ^{188}Pt has been performed at Inter University Accelerator Center (IUAC), Delhi using the ^{174}Yb (^{18}O, 4n) ^{188}Pt reaction, at a beam energy of 84 MeV. For these measurements a thin target [4] of 700 μg/cm^2 of enriched ^{174}Yb material evaporated on a 3.5 mg/cm^2 thick backing of natural Ta is used. A highly pure natural gold foil of thickness ~ 8 mg/cm^2 is used as stopper. The data is taken for different target –stopper distances ranging from 8 – 10,000 μm in 22 unequal steps. The results obtained are very encouraging and do indicate a somewhat low deformation for the yrast sequence in ^{188}Pt nucleus. However a sharp reduction in the collectivity with increasing spin in ^{188}Pt, contrary to the other light neighboring Pt nuclei, indicates the volatile nature of deformation in Pt nuclei near A ~ 190 at high spins which needs further theoretical investigations. The detailed analysis of results and other interesting conclusions drawn will be discussed during the presentation.

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