Determination of hexadecapole $\beta_4$ deformation of the light-mass nucleus $^{24}\text{Mg}$ using quasi-elastic measurement

Quasi-elastic scattering measurements were performed using $^{16}\text{O}$ and $^{24}\text{Mg}$ projectiles off $^{90}\text{Zr}$ at energies around the Coulomb barrier.

Data were analyzed in the framework of coupled channels. Bayesian analysis is carried out for $^{24}\text{Mg} + ^{90}\text{Zr}$ reaction. The hexadecapole deformation of $^{24}\text{Mg}$ has been measured very precisely for the first time.

**$\beta_2$ and $\beta_4$ of $^{24}\text{Mg}$ from present work:**

$\beta_2 = +0.43 \pm 0.02$, $\beta_4 = -0.11 \pm 0.02$

The present result clearly demonstrate that quasi-elastic scattering could be a potential probe to determine the ground state deformation of the exotic nuclei using low intensity radioactive ion beams.