Contribution ID: **120** Type: **Poster Presentation**

The Shape of 36Ar in its first 2 plus state

Thursday, 6 July 2023 15:52 (1 minute)

In 1970, a Coulomb excitation experiment was done in order to determine Spectroscopic Quadrupole moment of Argon-36 (36Ar) in its first excited state which has the total angular momentum of 2 and a positive parity. The 36Ar ion beam was bombarded towards a stationary Lead-206 (206Pb) target The Spectroscopic quadrupole moment was determined to be 0.11 ±0.06 e.b. At the time of the experiment, the distance of closest approach between the nuclei surfaces was 4.3 fm (fentometer) which is less than minimum distance of 6.5 fm for the experiment to be from nuclear force interference.
The Coulomb excitation experiment of 36Ar was conducted for a month at the ithemba LABS facility located at the Western Cape. The objective was to determine the Spectroscopic Quadrupole moment of 36Ar in its first excited state. The 36Ar ion beam was accelerated towards a 1 mg/□cm□^2 thick 194Pt (Platinum-194) stationary target. The gamma rays emitted by the de-excited nuclei were detected using the AFRODITE, which consist of eight clovers and each clover has four 50×70 □mm□^2 high purity Germanium crystal. The backwards scattered ion beam was detected by the double-sided CD-shaped silicon particle detector. The information about the gamma rays that were in coincidence with the scattered particles will be analysed using MIDAS MTsort offline. The doppler-corrected 36Ar and non-doppler corrected 194Pt spectra peaks acquired from MIDAS MTsort along with other spectroscopic information was analysed by the GOSIA program and from it, the Spectroscopic Quadrupole moment will be determined.

Apply to be considered for a student ; award (Yes / No)?

yes

Level for award;(Hons, MSc, PhD, N/A)?

MSc

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Session Classification: Poster Session 2

Track Classification: Track B - Nuclear, Particle and Radiation Physics