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Coulomb excitation reorientation effect of the first 2^+_{gs} state at 4.439 MeV in ^{12}C

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The reorientation effect (RE) plays a major role in Coulomb excitation theory as it facilitates information about the shape and degrees of quadrupole collectivity of even-even nuclei via measuring the diagonal matrix element $\langle 2^+_{gs} || E2 || 2^+_{gs} \rangle$ of the first 2^+_{gs} state. This in turn proportional to the spectroscopic quadrupole moment $[Q_S(2^+_{gs})]$ which provides direct information about the shape with its sign precisely. A safe Coulomb excitation reorientation effect measurement was performed at TRIUMF accelerator facility to determine the sign and magnitude of $Q_S(2^+_{gs})$ in ^{12}C . The first 2^+_{gs} state at 4439 keV in ^{12}C was Coulomb excited through inelastic scattering of ^{12}C beam at ~ 4.97 MeV/u energy impinging on a 1 mg/cm² thick ^{194}Pt target. The de-excited γ -rays were detected with highly-efficient and segmented TIGRESS clover detector array and the scattered particles were detected in coincidence with γ -rays using annular double sided silicon CD type detector (S2) which contains 24 rings and 32 sectors. The data have been analysed employing particle- γ coincidence, energy sharing and timing conditions. The Doppler corrected sum γ -ray spectrum shows the evidence for 4439 keV in ^{12}C . The experimental results and the details about determination of $Q_S(2^+_{gs})$ will be presented during conference.

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N/A

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