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Study of Shape Coexistence in ^{82}Sr

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The nucleus ^{82}Sr lies in a transitional region of the nuclear landscape, between $N=50$ spherical nuclei and the highly-deformed $N \leq 40$ region. The ratio of $B(E2; 4+ \rightarrow 2+)/B(E2; 2+ \rightarrow 0+)$ deviates heavily from systematics at ^{82}Sr which could indicate additional physics at relatively low excitation energy. Shape effects in ^{82}Sr have been investigated through the safe multi-step Coulomb excitation using the TIGRESS array at TRIUMF, with the intention of measuring the $B(E2)$ and Q_s values, in particular $Q_s(2+)$ and $Q_s(41)$. The model-independent Kumar-Cline sum rules will be used to establish the deformation in the intrinsic frame of the nucleus, allowing for the identification of phenomena such as shape coexistence. The extraction of transitional and diagonal matrix elements using GOSIA will probe the possibilities of shape coexistence and triaxial shapes. For background reduction, the particle-gamma coincidence technique has been used with TIGRESS and a double-sided silicon detector.

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