Exploring the onset of the N=60 shape coexistence in Sr

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While the sharp transition from spherical to deformed nuclei at N=60 is well established for the Sr, Zr nuclei, many details of this shape transition and the associated shape coexistence around N=60 are still unexplored. The study of the evolution of single-particle structure approaching N=60 can contribute significantly to further our understanding of the underlying competition between single-particle and collective degrees of freedom.

In this contribution we report on the results of a series of one-neutron transfer reactions in inverse kinematics carried out at TRIUMF's isotope separator and accelerator (ISAC) facility utilizing charge-bred post-accelerated beams of ^{94,95,96}Sr. The production of these beams utilized the 480 MeV proton beam from TRIUMF's main cyclotron to produce Sr beams from a UC_x target. The extracted, laser ionized beams were charge bred using an ECR before being accelerated to approximately 5.5 MeV/u in the superconducting ISAC-II heavy-ion accelerator. The experiment utilized the TIGRESS gamma-ray spectrometer which surrounded the SHARC charged particle detector array. States in ^{95,96,97}Sr were populated using the (d,p) reaction on a deuterated polyethylene target. The combination of detected gamma-rays as well as light charged particles is being used to extract cross-sections, proton angular distributions of the populated low-lying states. The experimental results are compared to DWBA calculations and large scale shell model calculations to gain insights into the underlying single-particle structure of these states.