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Single-Neutron Transfer on 86Kr and 93Sr

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The structure of nuclei around and above the N=50 shell closure provides insight into the interplay between single-particle and collective excitations in neutron-rich nuclei. As one adds neutrons above the N=50 shell closure, nuclei are observed to undergo a rapid change from single-particle excitations into collective modes around neutron number 60. Single-neutron transfer information on nuclei in this region helps to understand the evolution of the neutron orbitals above the shell gap.

Experiments were performed at the TRIUMF-ISAC radioactive beam facility studying single-neutron transfer on 86 Kr and 93 Sr. In the resulting 87 Kr, single-particle structure analysis of this data shows the evolution of neutron orbitals directly above the N=50 neutron shell closure. Angular distributions were measured to 7 states in 87 Kr, and spectroscopic factors are compared with shell model calculations and previous experimental measurements of the 86 Kr(d,p) 87 Kr reaction.

The structure of ⁹⁴Sr was observed via (d,p) reactions on ⁹³Sr. This experiment is the first ever population of ⁹⁴Sr via a ⁹³Sr(d,p) reaction. Angular distributions and associate spectroscopic factors for the transfers to 5 states were measured for the first time. Two excited states are updated to being spin $J^{\pi} = 3^+$ states in contrast with previous spin assignments.

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