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Neutron orbits near doubly-magic ^{78}Ni and ^{132}Sn from reactions with radioactive beams (Invited)

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Transfer reactions are a valuable tool to study the evolution of shell structure away from stability. In particular, studies of nuclei in the proximity of exotic doubly-magic nuclei like ^{78}Ni and ^{132}Sn are key systems to test our theoretical understanding, since the proximity of the doubly-magic core makes shell-model calculations feasible.
Single-neutron states in the Z=30, N=49 isotope ^{79}Zn have been populated using the ^{78}Zn(d,p)^{79}Zn transfer reaction in inverse kinematics at REX-ISOLDE, CERN. The experimental setup allowed the combined detection of protons ejected in the reaction, and of γrays emitted by ^{79}Zn. From the combined analysis of γ-ray and proton data, low-lying states in ^{79}Zn were observed and identified. Comparison with large-scale shell-model calculations permits to constrain the size of the N=50 shell gap in ^{78}Ni.
Neutron-hole states in ^{131}Sn were populated using the ^{132}Sn(d,t)^{131}Sn reaction at the HFRIB facility at Oak Ridge National Laboratory. Measured proton differential cross sections and their impact of single-hole energies in ^{132}Sn will also be presented.

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