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Single-particle states in 79Zn studied via single-neutron transfer

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Neutron-rich nuclei with magic numbers of neutrons and protons are reference points to map and understand the reorganization of the shell structure away from the line of beta stability. The region of nuclei near ^{78}Ni, the doubly-magic nucleus with the largest N/Z ratio, is the focus of considerable experimental and theoretical interest. The extent of the magicity of ^{78}Ni is still debated [1,2], since it is linked to the balance between the size of the Z=28 and N=50 shell gaps and the deformation-driving correlations produced by the promotion of nucleons across these gaps. Experiment IS491 aimed at the study of single-particle properties of ^{79}Zn, the even-Z N=49 isotone closest to ^{78}Ni. Low-lying states in ^{79}Zn were populated at Rex-Isolde via the ^{78}Zn(d,p) transfer reaction, in inverse kinematics. Transfer reactions are an ideal tool to determine effective single particle energies, linked to the size of the shell gap. The coincident detection of charged particles and gamma rays, permitted by the coupling of the T-REX and Miniball arrays, was of paramount importance for the understanding of the observed states, most of them populated for the first time. Results on ^{79}Zn level scheme and proton angular distributions will be shown. [1] M.-G. Porquet and O. Sorlin, Phys. Rev. C 85 (2012) 014307. [2] K. Sieja and F. Nowacki, Phys. Rev. C 85 (2012) 051310(R). *** This work was supported by the European Union Seventh Framework Programme through ENSAR, contract no. 262010, and by the project MEC Consolider - Ingenio 2010; CDS2007-00042.

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