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Proton-Neutron interaction around N=40 studied at ISOLDE

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One of the main goals of modern nuclear structure research is to identify changes in the mean field or residual interaction when going towards exotic systems. To track such changes, different observables are available for the experimentalist, like effective single particle energies for odd nuclei or values for the electric quadrupole transition strength in even-even nuclei. In this talk we show that the isospin degree of freedom gives a similar sensitivity to changes in shell structure. In this case the observable is the low-lying magnetic transition strength. A smooth contribution from the symmetry energy from the Bethe-Weiszäcker mass formula is needed to develop a consistent picture. We demonstrate the sensitivity to (sub)shell closures in case of e.g. N=16 (24O) or N=40 (68Ni). We show first results from a recent ISOLDE experiment using MINIBALL and T-REX. A highly intense 72Zn beam was used to populate nuclei beyond N=40. A tritium-titanium target was used to study both Coulomb excitation and the two-neutron transfer reaction simultaneously. Both these reactions are well suited to populate the low-lying off-yrast states of interest, related to these questions.

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