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Isospin dependence of NN correlations, quenching of spectroscopic factors, and effects on other nuclear structure observables

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Although the atomic nucleus consists of strongly interacting nucleons, it is noteworthy that for such strongly interacting quantum system the independent-particle model is proven to be a valid approximation and has provided a basic framework to explain many properties of nuclei. However, correlations between the nucleons, both of short- and long-range nature, modify the mean-field approximation and dilute the pure independent-particle picture. Notably, these correlations are thought to be the reason for the quenching of spectroscopic factors observed in $(e,e'p)$, $(p,2p)$ and single-nucleon direct reactions [1]. Following from the observed increase of the high-momentum component of the proton momentum density in a neutron-rich nucleus [2], we proposed a phenomenological approach to examine the role of NN short- and long-range correlations and their evolution in asymmetric systems [3]. The model predictions correlate well with the reduced proton occupancies for states below or near the Fermi level [4,5], as a function of the asymmetry $(N-Z)/A$, and also shed light on the question of quenching in intermediate energy single-nucleon knockout on complex targets [6].

In this talk I will discuss our work [3] and further implications of our approach to other low-energy nuclear structure observables.

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- [4] G. Kramer, H. Blok and L. Lapikas, *Nucl. Phys. A* **679** (2001) 267.
- [5] L. Atar et al., *Phys. Rev. Lett.* **120** (2018) 052501.
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