Nuclear structure studies relevant for new physics searches with xenon detectors

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Xenon detector experiments (such as KamLAND-Zen, EXO-200, XENONnT, PandaX-4T, etc.) have provided some of the most sensitive searches of physics beyond the standard model (BSM). These campaigns have placed emphasis on observing dark matter interactions and/or neutrinoless double beta decays ($0\nu2\beta$). Several next-generation experiments aim to build on this work and probe for BSM physics with significantly improved sensitivity. In relation to the above, this talk will present results from recent two-nucleon transfer studies in the $A = 136$ region. The measurements are used to robustly test predictions made with Hamiltonians that are also used to evaluate the nuclear matrix element for ^{136}Xe $0\nu2\beta$. Further implications concerning the possible detection of fermionic dark matter in large xenon-based detectors will also be briefly discussed.