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Nucleon localization within nuclear density functional theory¹ CHUNLI ZHANG, BASTIAN SCHUETRUMPF, WITOLD NAZAREWICZ, Michigan State Univ — Recently, a nucleon localization measure based on Hartree-Fock densities has been introduced to investigate α -cluster structures in light nuclei. Compared to the local nucleonic density, the nucleon localization function (NLF) has been shown to be an excellent indicator of cluster correlations. To investigate the cluster structures in light nuclei and study the development of fission fragments in heavy nuclei, we analyse NLFs in deformed nuclei. We use both the deformed harmonic oscillator model and self-consistent nuclear density functional theory (DFT) with energy density functionals UNEDF1 and UNEDF1-HFB, which were optimized for fission studies. In this contribution, we will discuss particle densities and spatial localization functions for deformed configurations of ⁸Be and ²⁰Ne and along fission pathways of ²³²Th and ²⁴⁰Pu. We illustrate the usefulness of the NLF by showing how the third hyperdeformed minimum of ²³²Th can be understood in terms of the ground states of ¹³²Sn and ¹⁰⁰Zr.

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