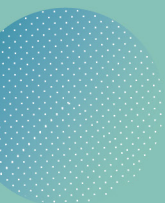




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Octupole correlations in the $N = Z + 2 = 56$ ^{110}Xe nucleus

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Abstract

This letter reports on the first observation of an octupole band in the neutron-deficient ($N = Z + 2$) nucleus ^{110}Xe . The ^{110}Xe nuclei were produced via the $^{54}\text{Fe}(^{58}\text{Ni}, 2n)$ fusion-evaporation reaction. The emitted gamma rays were detected using the JUROGAM3 gamma-ray spectrometer, while the fusion-evaporation residues were separated with the MARA separator at the Accelerator Laboratory of the University of Jyväskylä, Finland. The experimental observation of the low-lying 3- and 5- states and inter-band E1 transitions between the ground-state band and the octupole band proves the importance of octupole correlations in this region. These new experimental data combined with theoretical calculations using the symmetry-conserving configuration-mixing method, based on a Gogny energy density functional, have been interpreted as an evidence of enhanced octupole correlations in neutron-deficient xenon isotopes.

