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Novel shapes for exotic nuclei (remote)

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The study of exotic nuclei far from the β-stability line has been at the forefront of nuclear physics research since 1980s. The relativistic density functional theory has achieved great success in the study of nuclear structure in recent years.
In order to explore the effects of triaxial deformation in exotic nuclei and the existence of triaxially deformed halo nuclei, a self-consistent triaxial relativistic Hartree-Bogoliubov theory in continuum (TRHBc) is developed. Possible triaxially deformed halo nuclei are explored by taking aluminum isotopes as examples. The binding energies, nucleon separation energies, and charge radii are well reproduced. It is predicted that the experimentally observed nucleus, ^{42}Al, is a triaxially deformed halo nucleus, and there is a triaxial shape decoupling between its core and halo. Potential energy surfaces are constructed by the constrained calculations to verify the ground states obtained from unconstrained calculations.

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Session Classification: Session 18: Shapes, cranking models and best posters presentations