



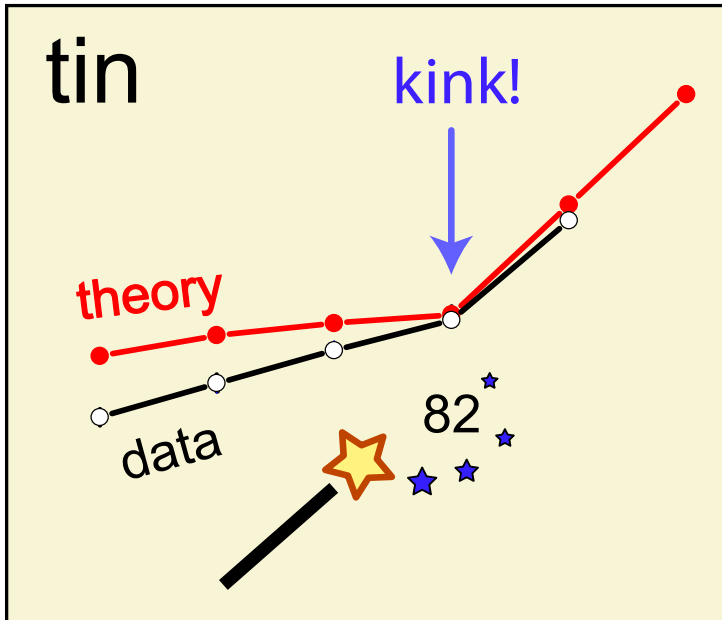
Neutron superfluidity and kinks in charge radii at magic numbers

Objectives

- A discontinuity at the doubly magic tin-132 has been revealed by recent experiments, similar to what has been observed in doubly magic lead-208 for which a number of theoretical explanations have been proposed.
- Most standard nuclear density functional calculations struggle with a consistent explanation of these discontinuities.

Impact

- The comparison with a recently developed energy density functional, which has been optimized for the charge radii along the chain of calcium isotopes, shows a remarkably good agreement with the experimentally observed kinks at magic numbers.
- According to the statistical correlation analysis employed the underlying mechanism is the reduction of neutron superfluid correlations in doubly-magic nuclei.



Accomplishments

- Publication: C. Gorges et al., Phys. Rev. Lett. 122, 192502 (2019).
- Highlighted as Editors' suggestion.
- Featured in Physics. [Synopsis: Tin get kinky.](#)

Evolution of the nuclear charge radii along the tin isotopic chain from experiment (circles) and from calculations (dots). The charge radii show a kink at the magic number $N=82$.