

## Studies of Pear-Shaped Nuclei

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### Abstract

For certain combinations of protons and neutrons it is expected that the shape of atomic nuclei can undergo octupole deformation, which would give rise to reflection asymmetry or a “pear shape”. In this talk I will describe how recent experiments carried out at CERN using REX-ISOLDE [1] and HIE-ISOLDE [2–5] and the Miniball gamma-ray spectrometer have provided evidence that several radium and radon isotopes have either stable pear shapes or are octupole vibrational in nature. I will also present the available data on octupole shapes in the mass region with  $Z \approx 56$  and  $N \approx 88$ . I will show that our data on transition moments present some challenges for theory. I will also briefly talk about the relevance of our measurements for atomic EDM searches, and discuss the future prospects for this field.

### References

- [1] L.P. Gaffney et al., *Nature* **497** (2013) 199-204
- [2] P.A. Butler et al., *Phys. Rev. Lett.* **124** (2020) 042503
- [3] P.A. Butler et al., *Nat. Comm.* **10** (2019) 2473
- [4] P.A. Butler et al., *Nat. Comm.* **11** (2020) 3560
- [5] P. Spagnoletti et al., *Phys. Rev. C* **105** (2022) 024323