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## New Experimental Platform for Atomic Parity Violation Studies in Ytterbium

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Precision studies of the weak interaction in atomic systems offer sensitive tests of the Standard Model and open avenues for exploring physics beyond it. Although the landmark atomic parity violation (APV) measurements in cesium represent a key reference in the field [1], further studies are necessary. Currently, two complementary experimental approaches are being pursued: (1) large-scale efforts at accelerator facilities aim to measure APV in highly charged ions, such as He-like uranium or europium, via two-photon laser spectroscopy [2]. These systems feature simple electronic structures, allowing for accurate theoretical predictions. (2) In parallel, compact table-top experiments provide competitive sensitivity. At the University of Crete, we have developed a new experimental setup for APV studies across various isotopes of ytterbium [3]. The goal is to improve upon the sensitivity of previous Yb APV measurements [4], enabling the extraction of neutron-skin effects across isotopes and the observation of nuclear-spin-dependent (NSD) contributions such as the nuclear anapole moment. Here, we present an overview of the experimental apparatus, its operating principles, and preliminary results.

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### References

- 1) C.S. Wood, et al., Science 1759, 275 (1997).
- 2) F. Ferro et al., Phys. Rev. A 81 (2010), 062503.
- 3) S. Nanos et al., Ann. Phys. 537, 2400261 (2025)
- 4) D. Antypas et al., Nature 15, 120 (2019)

**Autoren:** Prof. ANTYPAS, Dionysios (University of Crete); NANOS, Stefanos (University of Crete)

**Vortragende(r):** NANOS, Stefanos (University of Crete)

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