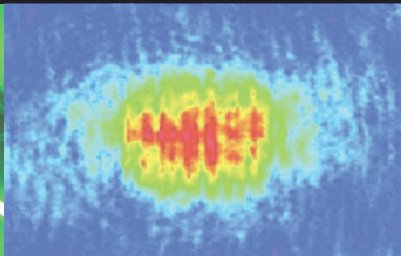


Joint UoC/FORTH AMO Seminar



14 October 2020, 16:30, Online Seminar



Towards neutron skin and anapole moment measurements in atomic ytterbium

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Studies of atomic parity violation (PV) provide a window to observe the effects of the weak interaction in atomic systems, thus offering information about the Standard Model and low-energy nuclear physics. Ytterbium (Yb) is a particularly good system for such studies, as it possesses two closely spaced opposite parity levels which are strongly mixed by the weak interaction, resulting in a large atomic PV observable. In addition, Yb has seven stable isotopes allowing for isotopic comparison of the PV effect. Of the seven isotopes, two possess nuclear spin, allowing for observations of nuclear-spin-dependent PV and extraction of the Yb nucleus anapole moment.

Following recent measurements of the variation of the PV effect in an isotopic chain of Yb, our Yb programme is now headed towards high-precision isotopic comparison of PV and observations of nuclear-spin-dependent PV effects. Precise isotopic comparison is expected to provide information about the neutron-skin variation among the Yb isotopes, while measurements of nuclear-spin-dependent PV are expected to provide a determination of the nuclear anapole moment of Yb, and thus aid in the understanding of intranuclear weak forces. I will discuss the Yb PV programme in Mainz, give an update on the current status of the work and talk about the prospects to achieve high-precision determinations of neutron-skin and anapole moment effects.

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