

## LASER IONIZATION SPECTROSCOPY OF AcF AND KING-PLOT ANALYSIS OF MOLECULAR ISOTOPE SHIFTS

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The research potential of radioactive molecules for both fundamental and applied science has recently been recognized [1,2] and significant progress has been marked at ISOLDE on both the production and the spectroscopy [3,4] of radioactive molecules. In addition to the first laser spectroscopy of RaF at the collinear resonance ionization spectroscopy (CRIS) experiment [3,4], which was triggered by theoretical predictions in Ref. [5], and its subsequent high-resolution study, the CRIS collaboration recently performed the first laser spectroscopy of AcF [6]. AcF has been proposed as a promising system for the first measurement of a nuclear Schiff moment across the nuclear chart. Simultaneously, experimental and theoretical progress in the excited electronic states of RaF and the manifestation of nuclear observables in molecular spectra [7] carried out by members of the CRIS collaboration has highlighted the potential of laser spectroscopy of radioactive molecules at radioactive ion beam facilities to probe nuclear and molecular observables that are not easily accessible by other methods and systems.

In this talk, recent results by the CRIS collaboration on the laser spectroscopy of AcF will be presented, along with theoretical work on the spectroscopy of lighter radioactive molecules that can provide access to nuclear and molecular observables that cannot be studied via other methods. The future directions of laser-spectroscopic studies of radioactive molecules at CRIS will also be discussed.

[1] arXiv:2302.02165 (2023) [2] CERN-INTC-2021-017 (2021) [3] Nature **581**, 396 (2020) [4] Physical Review Letters **127**, 033001 (2021) [5] Phys. Rev. A **82**, 052521 (2010) [6] CERN-INTC-2021-053 (2021) [7] Physical Review X **13** (1), 011015 (2023)

The complete author list is omitted from this abstract due to length constraints but will appear in the talk.