

Towards atomic parity violation experiments with laser trapped francium isotopes

Gerald Gwinner¹

¹ *University of Manitoba, Winnipeg, R3T 2N2, Canada*

Contact email: gwinner@physics.umanitoba.ca

In atoms, extremely weak electric dipole transitions between states of the same parity are induced by the parity-violating exchange of Z-bosons between the electrons and the quarks in the nucleus, an effect known as atomic parity violation (APV). By measuring this amplitude we can study neutral-current weak interactions with atomic physics methods and search for *new* physics such as extra gauge bosons and leptoquarks. APV is strongly enhanced in heavy atoms, making francium an interesting choice for a new APV experiment. TRIUMF's ISAC radioactive beam facility is now delivering intense beams of francium isotopes to our new laser trapping facility, where we plan to carry out APV experiments with cold, trapped, samples of Fr atoms. We report on first results, the measurement of hyperfine anomalies and isotope shifts in several Fr isotopes, and give an outlook on upcoming experiments.