



Contribution ID: 33

Type: **Talk**

Towards parity nonconservation measurements in francium

Thursday 14 June 2018 14:30 (25 minutes)

We are developing experiments to study parity nonconservation effects in neutral francium atoms at the ISAC radioactive beam facility at TRIUMF. We are using laser cooling and trapping techniques to prepare the atoms for our measurements and our current effort is based on optical spectroscopy of Stark induced $7s-8s$ atomic transitions aiming at Standard Model test of the strength of the electron-quark weak neutral coupling. We have observed this transition in several isotopes of francium using an equal frequency two photon excitation scheme. We have measured the isotope shifts in the $7s-8s$ transition and combining our measurements with previously measured isotope shifts of the $7s-7p_{1/2}$ transition obtained the ratio of the field shift constants. Our measured value of the field shift ratio (1.228 ± 0.019) is in good agreement with ab-initio theory [see M. Kalita et al. Phys. Rev. A accepted]. This ratio is sensitive to the electron wavefunctions near the nucleus, needed to interpret the planned parity nonconservation measurements. We will also discuss recent developments towards observing the Stark-induced $7s-8s$ transitions in francium and the equivalent $5s-6s$ transitions in rubidium.

Primary author: Dr KALITA, Mukut Ranjan (TRIUMF)

Presenter: Dr KALITA, Mukut Ranjan (TRIUMF)

Session Classification: parity violation/weak interaction