Abstract Submitted
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Isotope shift measurements on the D1 line in francium isotopes at TRIUMF[1] R. COLLISTER, University of Manitoba, M. TANDECKI, University of Manitoba / TRIUMF, G. GWINNER, University of Manitoba, J.A. BEHR, M.R. PEARSON, TRIUMF, E. GOMEZ, Universidad Autonoma de San Luis Potosi, S. AUBIN, College of William and Mary, J. ZHANG, L.A. OROZCO, University of Maryland — Francium is the heaviest alkali and has no stable isotopes. The longest-lived among them, with half-lives from seconds to a few minutes, are now available in the new Francium Trapping Facility at TRIUMF, Canada, for future weak interaction studies. We present isotope shift measurements on the $7S_{1/2} \rightarrow 7P_{1/2}$ ($D1$) transition on three isotopes, 206, 207 and 213 in a magneto-optical trap. The shifts are measured using a c.w. Ti:sapphire laser locked to a stabilized cavity at the mid-point between two hyperfine transitions of the reference isotope ^{209}Fr. Scanning tunable microwave sidebands locate transitions in the other isotopes. In combination with the $D2$ isotope shifts, analysis can provide a separation of the field shift, due to a changing nuclear charge radius, and specific mass shift, due to changing electron correlations, in these isotopes.

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