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Towards measuring atomic parity violation effects in francium

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Measurements of parity violation effects in atomic systems test the Standard Model at low energies and probe nucleon-nucleon interaction. Francium is a good system for atomic parity violation (APV) studies, because APV effects are predicted to be large in francium and its atomic structure is favourable for theoretical calculations. We are developing experiments to study APV effects in neutral francium atoms at the ISAC radioactive beam facility at TRIUMF. We use techniques of laser cooling and trapping to prepare the atoms for our measurements. Our current effort is based on optical spectroscopy of the electric dipole forbidden 7s-8s atomic transition aiming at the test of the strength of the electron-quark weak neutral coupling. In this talk, I will present our recent observation of the Stark (electric field) induced 7s-8s transition and our roadmap towards observing APV.

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