Abstract Submitted
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Microwave and RF potentials for atom trapping and precision interferometry[1] JIM FIELD, AUSTIN ZILTZ, MEGAN IVORY, SETH AUBIN, College of William and Mary — We present plans and progress towards the development of microwave and RF (u/RF) potentials using atom chip technology for interferometry and novel trapping of ultracold potassium atoms. These potentials are inherently conservative, spin-dependent, and allow tunable atom-atom interactions via magnetic Feshbach resonances. They can be used for interferometry of trapped ultracold thermal and quantum gases, atomtronic and quantum pumping "circuits," and sympathetic-adiabatic cooling. We give theoretical overviews of u/RF potentials and interferometers with specific application to Casimir-Polder force measurements. The small hyperfine splitting of potassium isotopes simplifies the engineering of u/RF potentials, while also providing bosonic and fermionic species. We focus on the use of fermion isotopes for high accuracy interferometric and atomic clock applications.

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Jim Field
College of William and Mary

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