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### **Polarizability Measurements in a Multi-Species Atom Interferometer<sup>1</sup>**

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We have measured the polarizability of Na, K, and Rb atoms by applying an electric field gradient in an atom interferometer. We measured the DC ground state polarizability of Na atoms with a precision of 1%, and we are working on similar precision for direct measurements with K and Rb atoms. By using nanofabricated gratings, we have observed diffraction and interference fringes for several different types of atoms in the same apparatus. We can use the same electric field region, the same collimating slits, and same detector for each atomic species. With this approach, some systematic uncertainties in the measurement of atomic polarizability are the same for every atomic species. We therefore anticipate reporting ratio measurements of polarizabilities with precision better than 1%.

<sup>1</sup>In collaboration with William Holmgren, Vincent Lonij, and Dr. Alex Cronin, University of Arizona.