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Atom chip-based ultracold potassium for testing microwave and RF potentials AUSTIN ZILTZ, MEGAN IVORY, CHARLES FANCHER, ANDREW PYLE, SETH AUBIN, College of William and Mary — We present progress on an experiment to manipulate and trap ultracold atoms with microwave and RF (μ/RF) AC Zeeman potentials produced with an atom chip. These μ/RF potentials are well suited for atom interferometry and 1D many-body physics studies due to their inherent spin-dependent nature and ability to operate in conjunction with magnetic Feshbach resonances to tune interactions. We have completed a dual species, dual chamber apparatus for producing ultracold rubidium and potassium gases on an rf-capable atom chip. The system produces Bose-Einstein condensates of 10^4 ^{87}Rb atoms. Recently, we have successfully trapped ^{39}K on the atom chip, and are working towards cooling it sympathetically via microwave evaporation of rubidium. We intend to exploit the μ/RF potentials for atom interferometry as a spin-dependent beam splitter acting on optically trapped ^{39}K in the vicinity of the atom chip.

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