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Progress on and Instrumentation for an Ion Inteferometer¹ JAROM JACKSON, JAMES ARCHIBALD, ERICKSON CHRISTOPHER, DALLIN DURFEE, Brigham Young University — We describe progress on a cold ion matter-wave interferometer. The ions are generated by laser-cooling strontium and then photo-ionizing the atoms with a two-photon transition to an auto-ionizing state in the continuum. A pair of electrodes will set the kinetic energy of the ions. Splitting and recombining the quantum waves will be achieved using Raman transitions driven by a pair of laser beams. These beams are created by injection locking a pair of diode lasers with two beams from a master laser which have been shifted to differ in frequency by the strontium ion hyperfine splitting. Optical pumping and detection of the ions will be done with a laser locked to a column of strontium vapor which has been photo-ionized.

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