

Abstract Submitted
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Slow Ion Interferometry¹ CHRISTOPHER ERICKSON, DALLIN DURFEE, Brigham Young University — We will discuss an ion interferometer which is under construction. The device will utilize a laser-cooled source of $^{87}\text{Sr}^+$ ions which will be split and recombined using stimulated Raman transitions inside of a conducting cylinder. The interferometer will be able to measure electric and magnetic fields with unprecedented precision. Potential uses of the device include practical applications such as the precision measurement of the evolution of fields near solids to reveal their electronic structure. It will also be used for fundamental tests of the basic laws of electromagnetism and the search for a non-zero photon rest mass. The device should enable the detection of a possible photon rest mass more than 100 times smaller than previous laboratory experiments. We will discuss both the details of the device and the theory connecting deviations from Coulomb's inverse-square law to a theory of massive photons.

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