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Searching for Massive Photons with Ion Interferometry[1] DALLIN DURFEE, BRIAN NEYENHUIS, DAN CHRISTENSEN, Brigham Young University — We will discuss an ion interferometer under construction that should enable the detection of a possible photon rest mass more than 100 times smaller than previous laboratory experiments. In the apparatus a beam of $^{87}Sr^{+}$ ions will be split and recombined using stimulated Raman transitions inside of a conducting cylinder. Deviations from Coulomb's law can then be detected by measuring the phase shift of the interferometer as the potential applied to the conducting cylinder is changed. 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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