Abstract Submitted
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Searching for Photon Rest Mass with Matterwave Interferometry[1] DALLIN S. DURFEE, CHRISTOPHER J. ERICKSON, Brigham Young University — We discuss a proposed test of Coulomb's inverse-square law using matterwave interferometry. A deviation from the inverse-square law could be related to a possible non-zero rest mass of the photon, the exchange Boson for the electro-magnetic force. In the experiment, the wavefunction of ions will be split and recombined inside of a conducting shell. From the interferometer phase, it can be determined if fields in the shell change as the voltage applied to the shell is altered. If a changing field is detected, a violation of Coulomb's law is implied. In such an experiment, using reasonable experimental parameters, it could be possible to detect a photon rest mass as small as a several time 10^{-53} kg.

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