Abstract Submitted
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Developing a Quantum Electron Microscope[1] CHRISTOPH KOHSTALL, BRANNON KLOPFER, JOSH FRANCIS, GUNNAR SKULASON, THOMAS JUFFMANN, MARK KASEVICH, Physics Department, Stanford University, Stanford, California 94305, USA, QEM TEAM — We develop a new electron microscope based on the interaction-free measurement principle [1,2]. Such a Quantum Electron Microscope (QEM) [3] may enable imaging of biological samples with radiation doses so small that they are non-lethal. The realization of the QEM will require precise control over the quantum motion of free electrons. On this poster, we discuss our approach to build a QEM including the realization of an electron resonator and an electron amplitude beam-splitter. On top of the QEM application, these developments will advance the electron analogue to photon quantum optics.[1] A. C. Elitzur and L. Vaidman, Found. Phys. 23, 987 (1993)[2] P. Kwiat, H. Weinfurter, T. Herzog, A. Zeilinger, and M. A. Kasevich, Phys. Rev. Lett. 74, 4763 (1995)[3] W. P. Putnam and M. F. Yanik, Phys. Rev. A 80, 040902(R) (2009)

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