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Manipulating small numbers of electrons on top of a superconducting resonator GERWIN KOOLSTRA, GE YANG, DAVID SCHUSTER, University of Chicago, - TEAM — Electrons on helium is a unique 2-dimensional system on the interface of superfluid helium and vacuum. The motional and spin states of a single electron trapped on superfluid helium could form an ultra-stable building block of a novel hybrid quantum computer. In previous experiments [1] we have shown that we can reliably trap and detect large numbers of electrons on top of a microwave resonator. Despite these efforts, isolating a single electron in our system has proven to be non-trivial. Here, we present a newly developed simulation technique that visualizes manipulations on small electron configurations and sheds light on the hidden physics behind our experimental signal. Additionally, we report on experimental progress towards detecting single electrons. [1] Ge Yang et al., Phys. Rev. X 6, 011031 (2016)

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