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A Novel Method to Create Multielectron Bubbles JIEPING FANG, ANATOLY DEMENTYEV, Harvard University, JACQUES TEMPERE, Universiteit Antwerpen, ISAAC SILVERA, Harvard University — A multielectron bubble (MEB) in liquid helium is a fascinating object with a spherical two-dimensional electron gas on its surface. Recent theoretical studies of MEBs discuss a plethora of new phenomena¹. We describe a novel way of creating MEBs and discuss possible ways of trapping them. An electrically heated tungsten filament submerged in superfluid helium is surrounded by a vapor sheath containing electrons due to thermionic emission. We were able to pull MEBs from the sheath by applying electric fields up to 15kV/cm. The motion of MEBs was captured using a high-speed camera (6400 frames/sec). The trajectory of bubbles was clearly influenced by the electric field, which proved that bubbles were charged. In a separate experiment we measured the charge of such an MEB to be as high as 10^{-9} C. We plan to trap MEBs using electromagnetic trap, which will enable extensive experimental studies of these elusive but exciting objects. [1] J. Tempere, I. F. Silvera, and J. T. Devreese, *Surface Science Reports*, **62**, 159, 2007.

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