# Capture of $He_2^*$ Molecules by Vortex Lines in Superfluid $^4$He at $T < 0.2\,\mathbf{K}$

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We report preliminary results of experiments on decorating quantized vortex lines in superfluid $^4$He by excimer molecules $He_2^*$. The molecules, created by electrons field-emitted from a tungsten tip, travelled several centimetres to gridded detector electrodes subject to electric field $10^4$–$10^5\,\mathrm{V\,cm^{-1}}$. The detector current of polarity correlated with the polarity of the detector field was observed below $T = 0.2\,\mathrm{K}$, but it can be suppressed by rotating the cryostat at angular velocity above $\Omega = 0.2\,\mathrm{rad\,s^{-1}}$ normal to the molecule path. The temperature dependence of the current has a sharp peak at $T = 0.13 \pm 0.01\,\mathrm{K}$, below which it gradually increases with cooling before saturating at $T < 0.06\,\mathrm{K}$. We suppose that the molecules travel trapped on the cores of vortex lines, which are created and propelled away from the tip by injected electrons. Collisions of trapped molecules result in ionization of one of them, after which the detector field can separate the resulting ions. We tentatively attribute the peak at $T = 0.13\,\mathrm{K}$ to the condensation of $^3$He impurities on vortex cores – these might affect the rate of diffusion of trapped molecules.