

Abstract Submitted  
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**Capture and emission of an electron from a single trap in a InAs semiconductor nanowire and influence on its conductance**<sup>1</sup> JOSEPH SALFI, IGOR SAVELYEV, MARINA BLUMIN, SELVA NAIR, HARRY RUDA, University of Toronto, CENTRE FOR ADVANCED NANOTECHNOLOGY TEAM — Experiments on random telegraph noise in InAs nanowires demonstrate regimes of gate voltage where their conductance is appreciable but also intriguingly sensitive to trapping of a single electron. When a defect is charged repulsively/discharged, we observe transitions from a conductive to an insulating state, and vice versa. The phenomena is tied directly to the screened potential produced by the repulsive defect. We discuss the dependence of the conductance switching amplitude on electron density, nanowire diameter, and dielectric constant of the nanowire's surroundings. We also discuss electronic properties of traps we've encountered as well as trapping and de-trapping mechanisms. The results are of significance for fundamental studies of defects in one dimensional conductors, as well as device-oriented applications of nanowires such as nano-electronic memories and sensing devices whose performance is tied to their sensitivity to charge.

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