

Abstract Submitted
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Strong Tuning of Spin Orbit Interaction in an InAs Nanowire by an Electrolyte Gate¹ DONG LIANG, XUAN P.A. GAO, Department of Physics, Case Western Reserve University — Manipulating electron spin in solid state devices has been the main target of spintronics. A key concept in many spintronic devices is to apply gate voltage or electric field (E) to tune spin precession via the Rashba spin orbit interaction (SOI). Quasi-one dimensional (1D) indium arsenide (InAs) nanowires are promising platforms in this regard due to InAs's strong intrinsic SOI and more effective control of Rashba SOI in 1D system with uni-directional momentum. Here, we demonstrate efficient control of Rashba SOI where E is created at the surface of InAs nanowire by solid electrolyte surrounding gate. Six-fold tuning of Rashba coefficient and 2.5 order of magnitude tuning of spin relaxation time are achieved within only 1 V of gate bias. Such a dramatic tuning of SOI paves a way towards quasi-1D nanowire spintronic devices with low power consumption.

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