

Abstract Submitted
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Electrical spin injection to Germanium using a single crystalline Fe/MgO/Ge tunneling junction YI ZHOU, LI-TE CHANG, University of California, Los Angeles, WEI HAN, University of California, Riverside, FAXIAN XIU, MINSHENG WANG, University of California, Los Angeles, MICHAEL OEHME, JOERG SCHULZE, Universitaet Stuttgart, ALEXANDROS SHAILOS, California Nano System Institute, ROLAND KAWAKAMI, University of California, Riverside, KANG WANG, University of California, Los Angeles — Germanium has long been predicted a superior candidate for spintronics with enhanced spin lifetime and transport length due to low spin-orbit interaction and lattice inversion symmetry. One of the critical challenges, however, is to electrically create spin accumulation in otherwise non-magnetic Ge. In this work, we report electrical spin injection to bulk n-type Ge using a single crystalline Fe/MgO/Ge tunneling junction. The spin lifetime and diffusion length are extracted from both 3-terminal Hanle measurement and non-local spin valve measurement. The spin relaxation mechanism in n-type Ge has also been explicitly analyzed from the bias and temperature dependence of the spin relaxation rate.

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