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Nb doped TiN as a superconducting electrode for spin polarization measurements of oxides DIPANJAN MAZUMDAR, MANJIT PATHAK, XING ZHONG, VIJAY KARTIK, ARUNAVA GUPTA, PATRICK LECLAIR, Center for Materials for Information Technology, University of Alabama, Tuscaloosa, AL 35487, MINT ALABAMA SPINTRONICS TEAM — Spin Polarized tunneling (SPT) measurements are an unambiguous way of measuring the interface spin polarization (SP) of oxide thin films and interfaces. SPT uses a superconducting electrode as a spin detector, probing within ~ 1 meV of the Fermi level. However the commonly used superconductor, namely Al, is not suitable for oxides due to its strong chemical affinity for oxygen. Nitrides like TiN and NbN alleviates this problem. Here we propose the use of Nb doped TiN. The critical temperature (T_c) and magnetic field (H_c) for TiN are too low for practical SPT measurements. While NbN has a higher T_c and H_c , its high spin-orbit scattering rate makes it less ideal for SPT [1]. TiNbN should provide a sufficiently high H_c and T_c while maintaining a sufficiently low spin-orbit scattering rate for high-resolution SPT measurements. We present measurements of known high SP oxides (LaSrMnO₃) and of all-oxide spin-filter devices (LSMO/STO/NFO).

[1] Hyunsoo Yang *et al.* Appl. Phys. Lett. **88**, 182501 (2006)

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