

Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Measurement and simulation of AlSb/InAs triple barrier resonant tunneling diodes. NanoJapan program summer 2007¹ JEFFREY RUS-SOM, KRISTJAN STONE, GSIST, Hokkaido University, Japan; Dept. of Physics and Astronomy, Rice University, TAKAAKI KOGA, GSIST and CRIS (Sousei), Hokkaido University, Japan; CREST, JST — Recently, Koga *et al.* [1] proposed to make a spin filter out of only non-magnetic semiconductors. This spin filter consists of a triple barrier resonant tunneling structure (TB-RTS), and the Rashba spin-orbit coupling effect is utilized for matching the spin-dependent resonance levels, which would result in a high spin filtering efficiency. To test this theoretical idea, we obtained TB-RTS samples with InAs layers as quantum wells and AlSb layers as barriers from Tohoku University and studied their I-V characteristics. To understand the physics of our experimental $I - V$ curves obtained at 300, 77, and 4.2K, we also performed theoretical simulations. The authors acknowledge the growth of TB-RTS by Dr. K. Ohtani of Tohoku University. [1] T. Koga, J. Nitta, H. Takayanagi and S. Datta, Phys. Rev. Lett. **88**, 126601 (2002).

¹Supported by the Nano Japan Program of NSF and the CEED Internship Program of Hokkaido University

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Date submitted: 26 Dec 2007

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