

Abstract Submitted  
for the MAR06 Meeting of  
The American Physical Society

**Quasi-one-dimensional spin field-effect transistors** JAE-SEUNG JEONG, HYUN-WOO LEE, Pohang University of Science and Technology — We study a spin field effect-transistor(SFET) with multiple transport modes. Energy dispersion relations and spin profiles of eigen-transport modes are examined numerically and analytically for weak and strong Rashba spin-orbit coupling parameters. Electron transport properties of the multiple-mode SFET are investigated including the Fabry-Perot-type interference due to multiple reflections and the peak splitting by external magnetic fields. Impurity scattering effects are also addressed.

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Date submitted: 30 Nov 2005

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