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Spin-Valve Photo-Transistor BIQIN HUANG, IGOR ALTFEDER, IAN APPELBAUM, University of Delaware — The Spin-Valve Photo-Transistor is a semiconductor-ferromagnetic metal multilayer-semiconductor transistor operated by photo- exciting hot electrons in the emitter semiconductor into a Schottky collector. We have realized this device using a vacuum- bonded float-zone Si/multilayer/n-InP structure. To distinguish the emitter interband-excited component of collector current from base/collector internal photoemission, we use a lockin spectroscopy sensitive only to the magnetocurrent. Our experimental results indicate a pathway to improve the magnetocurrent of a related device, the Spin- Valve Photo-Diode, by increasing the fraction of hot electron current that travels through both layers of the ferromagnetic spin-valve.

Biqin Huang
University of Delaware

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