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Perpendicular Hot Electron Transport in the Spin Valve Photo-Diode BIQIN HUANG, IAN APPELBAUM, Electrical and Computer Engineering Department, University of Delaware, Newark, Delaware, 19716 — The spin valve photo diode (SVPD) provides a new way to explore perpendicular hot electron transport in ferromagnetic multilayers using photoexcitation and internal photoemission. Since electrons are excited everywhere in the metallic multilayer, structure geometry is vital to optimize the magnetocurrent (MC). Initial theoretical models indicate that the MC should increase by increasing the thickness of a capping layer at the surface, but experiments demonstrate a nonmonotonic dependence resulting in an optimum capping layer thickness to maximize MC. The inconsistency between experiment and this theoretical model is also discussed, leading to a new proposal for hot electron transport in the SVPD.

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