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Interface-sensitive study of ultrafast spin dynamics in multilayer semiconductors Y.D. GLINKA, Vanderbilt University, T.V. SHAHBAZYAN, Jackson State University, J.K. MILLER, N.H. TOLK, Vanderbilt University, X. LIU, Y. SASAKI, J.K. FURDYNA, University of Notre Dame — We report the first application of pump–probe second harmonic generation (SHG) measurements to characterize optically induced magnetization in non-magnetic multilayer semiconductors GaAs/GaSb/InAs. A circularly-polarized pump beam has been used to inject electrons into the conduction band of GaAs, where the photons impart their angular momentum to electron-hole pairs. Because of the interface-sensitive method, the spins accumulated at the GaSb/InAs interface have been monitored. Subsequent precession of these spins about the applied magnetic field has then been detected by a time-delayed probe pulse as an interfacial magnetic field induced SHG response. The electron and spin transport through the heterostructure takes place on the time frame of 15-20 ps, and it is followed by the relaxation of interfacial magnetic and electric fields on the time scale of 100 ps.

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