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**Optical investigations of the photo-spin-voltaic effect in metal/magnetic insulator heterostructures** SUBASH KATTEL, JOSEPH R. MURPHY, University of Wyoming, DAVID ELLSWORTH, PENG LI, MINGZHONG WU, Colorado State University, WILLIAM D. RICE, University of Wyoming — Pure spin currents in metals can be produced via injection from thermal gradients applied across magnetic insulators (spin Seebeck effect) or by utilizing microwave-driven spin precession in an adjacent ferromagnet (spin pumping). Recently, pure spin currents were directly created in a normal metal by optically exciting nanometer-thick Pt on $Y_3Fe_5O_{12}$ (YIG). Our initial measurements of the photo-spin-voltaic (PSV) effect with a broadband light source suggested that photo-generated carriers in the Pt produced a spin voltage when excited with near-infrared light. Here, we use narrowband excitation to show that the PSV signal can be generated across a broad optical range; we observe that the PSV effect is nearly constant from 350 to 1600 nm. Despite strong spin-orbit coupling in Pt, we show that the PSV effect is insensitive to the light polarization and only depends on the optical power. To distinguish the PSV effect from light-induced heating, we performed time- and field-dependent measurements and saw significant differences in the respective behaviors. Although continued work is necessary, our measurements suggest that pure spin currents can be optically generated in Pt/YIG hetereostructures over spectral ranges that span the Si/InGaAs detection gap.

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