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Exploration of spintronic heterostructures for broadband terahertz generation[1] EVAN JASPER, M.T. WARREN, T.T. MAI, J. BRANGHAM, F. YANG, R. VALDÉS AGUILAR, Department of Physics, The Ohio State University. Columbus, OH 43210. — The generation of terahertz (THz) radiation for research purposes has historically been dominated by three techniques: photoconductive antennas, optical rectification in optical nonlinear media (ZnTe, GaP, DAST, etc.), and laser-induced air-based plasma THz emission. Each technique offers tradeoffs between signal-to-noise, power, bandwidth, ease of generation, and cost. Recently a new technique has been developed which utilizes the inverse spin Hall effect in a spintronic heterostructure to transform a laser-induced spin-polarized charge current into a transverse charge current and thereby emit a THz pulse. The THz pulses generated by these heterostructures have a broad bandwidth comparable to that offered by air-based plasma techniques, and a power conversion efficiency, low emitter cost, and ease of use similar to that offered by optical rectification in ZnTe. We have measured THz emission of a heterostructure of W|CoFe|Pt grown on MgO with an applied in-plane magnetic field, and will report on further exploration of this class of THz emitter.

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