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Ultrafast Time-correlated Measurements of Spin-Seebeck effect in Yttrium Iron Garnet[1] JOHN JAMISON, BRANDON GILES, Department of Materials Science and Engineering, The Ohio State University, Columbus, OH, ZIHAO YANG, Department of Electrical and Computer Engineering, The Ohio State University, Columbus, OH, ROBERTO MYERS, Department of Materials Science and Engineering, The Ohio State University, Columbus, OH — Recently, the time dependence of the spin-Seebeck effect (SSE) has been measured using optical pulses. These measurements suggest a time response faster than 5ns[1]. Here we present time-correlated measurements of the spin-Seebeck effect in Yttrium Iron Garnet (YIG) using an ultrafast laser. The pulsed beam is split into two individually modulated beams with a controllable delay time with sub-picosecond time resolution. The laser pulses are absorbed by a top Pt contact which generates a transient thermal gradient resulting in a spin current crossing the interface. The spin current is detected as a transverse voltage arising from the inverse spin Hall effect in Pt. We will present measurements of the time-correlated SSE signal from the two pulses as a function of delay time out to 1 ns. [1] Roschewsky et al., Appl. Phys. Lett., 104, 202410 (2014).

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John Jamison
The Ohio State University

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