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Temperature dependences of magnetic anisotropy and longitudinal spin Seebeck effect in $Y_3Fe_5O_{12}$[1] VIJAYSANKAR KALAPPATTIL, RAJA DAS, MANH-HUONG PHAN, HARIHARAN SRIKANTH, Department of Physics, University of South Florida, Tampa FL 33620 — Spin caloritronics is an emerging, exciting research area in condensed matter owing to its potential use in advanced spintronics devices. Pure spin current without having charge current has been achieved though spin Seebeck effect (SSE). Over the last 7 years SSE has been observed in ferromagnetic metals, insulators, and semiconductors using longitudinal and transverse SSE measurement configurations. In this work, we have carried out an experimental study to understand the effect of magnetic anisotropy on the temperature evolution of longitudinal spin Seebeck effect (LSSE) in a single crystalline yttrium iron garnet (YIG). The effective anisotropy field (H_K) and inverse spin Hall (ISH) voltage (V_{ISH}) were measured using the radio-frequency transverse susceptibility (TS) and LSSE configuration, respectively. The V_{ISH} of a 15 nm Pt strip on (6*2*1 mm) YIG slab with a temperature gradient of 3 K was measured in the temperature range of 120 to 300 K. The observed values of V_{ISH} vary from 1 microV for 120 K to 0.5 microV for 300 K, These values fall into the previously reported theoretical and experimental results. The temperature evolution of H_K has been compared with that of V_{ISH} to gain better fundamental understanding.

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