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Magnon Temperature Sensing in YIG and Permalloy using Brillouin Light Scattering[1] KEVIN OLSSON, KYONGMO AN, XIN MA, Department of Physics, University of Texas at Austin, SEAN SULLIVAN, Texas Materials Institute, University of Texas at Austin, VIJAY VENU, MAXIM TSOI, Department of Physics, University of Texas at Austin, JIANSHI ZHOU, Texas Materials Institute, University of Texas at Austin, LI SHI, Department of Mechanical Engineering, University of Texas at Austin, XIAOQIN LI, Department of Physics, University of Texas at Austin — In spin caloritronics, many phenomena crucially on knowledge the magnon temperature. We investigate Brillouin light scattering (BLS) as a method for measuring magnon temperature. The magnon BLS spectra offer three temperature dependent parameters: peak frequency, linewidth, and integrated intensity. The BLS spectra of magnons in a ferrimagnetic insulator (yttrium iron garnet or YIG) and a ferromagnetic metal (permalloy or Py) are measured at different temperatures under uniform heating. The contributions to the temperature dependence of the three BLS spectra parameters are discussed and the temperature precision of each parameter is determined. We find the BLS integrated intensity has opposite temperature dependence between YIG and Py, due to magneto-optics effects. This finding indicates the BLS integrated intensity must be corrected for these effects before the intensity can be used as a direct measurement of magnon population.

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