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Theory of phonon-driven spin Seebeck effect HIROTO ADACHI, Japan Atomic Energy Agency, JUN-ICHIRO OHE, Toho Univeresity, SABURO TAKAHASHI, Tohoku University, SADAMICHI MAEKAWA, Japan Atomic Energy Agency — Spin Seebeck effect refers to a thermal spin injection occurring over millimeter scales from a ferromagnet into an attached nonmagnetic metal [Uchida et al., Nature 455, 778 (2008)]. We discuss the importance of the phonon-drag process in the spin Seebeck effect. Our theory of phonon-drag spin Seebeck effect [Adachi et al., Appl. Phys. Lett. 97, 252506 (2010)] explains simultaneously the local nature of the spin Seebeck effect [Jaworski et al., Nature Materials 9, 898 (2010); Uchida et al., Nature Materials 10, 737 (2011)] and the signal enhancement at low temperatures [Jaworski et al., Phys. Rev. Lett. 106, 186601 (2011)]. We also discuss the difference between our approach and that developed in Xiao et al., Phys. Rev. B 81, 214418 (2010).

Hiroto Adachi
Japan Atomic Energy Agency

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