

Abstract Submitted
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Dynamic spin Seebeck coefficient and thermo-spin Hall conductivity in systems with Rashba and Dresselhaus spin-orbit coupling¹ JESUS MAYTORENA, PRISCILLA IGLESIAS, Centro de Nanociencias y Nanotecnologia, Universidad Nacional Autonoma de Mexico — The generation of spin currents by thermal gradients is a central issue of spin caloritronics. In addition to the recently observed spin Seebeck effect, a transverse thermoelectric effect has been proposed. This is the generation of a spin Hall current by a temperature gradient in a two-dimensional electron gas (2DEG) with Rashba spin-orbit interaction (SOI). We calculate the spin Seebeck coefficient and the thermo-spin Hall conductivity tensor of the spin current response induced by a frequency dependent temperature gradient in a 2DEG with Rashba and Dresselhaus SOI. We consider quantum wells grown in the main crystallographic directions. The spin splitting caused by SOI opens the possibility of resonant effects due to transitions between the spin-split subbands in response to alternating thermoelectric fields and temperature gradients in the THz regime. The spin current response shows characteristic spectral features in notable contrast to the pure Rashba coupling case. Such behavior is caused by the reduced symmetry of the momentum space available for transitions and the presence of critical points. This anisotropic dynamic response could be useful for spin manipulation via thermal means.

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