Spin Hall Conductivity and Spin Accumulation in Diffusive Transport Regime

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Two dimensional electron gas (2DEG) with spin-orbit interaction may have a potential relevance to novel spin-electronics devices because of the controllability of spins only by the external electric field. The spin Hall effect is such a typical example. The persistent spin Hall current recently proposed for 2DEG with Rashba spin-orbit interaction, however, has been shown to be suppressed by introducing the effect of scattering. On the contrary, the spin Hall current in systems with other types of spin-orbit interaction seems to be strong against the effect of scattering. The spin accumulation in the non-equilibrium state is another important feature of 2DEG. So far, we have studied the spin Hall conductivity and spin accumulation in the diffusive regime with non-magnetic impurity scattering. In the presentation, we will give results of the spin Hall conductivity and the spin accumulation for the diffusive regime with magnetic impurity scattering.

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