

Spin Hall Effect in a Two –Dimensional Electron Gas

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Abstract:

In recent years, the spin Hall effect has been the focus of a very intensive research activity, due to its potential for developing spintronic devices. Its understanding in a two-dimensional electron gas requires a description of how different sources of spin-orbit interaction affect the coupling of the spin and charge degrees of freedom. In the practitioner's jargon, one makes the useful distinction between extrinsic and intrinsic effects, with the former referring to spin-orbit interaction due to the random impurities and the latter originating from the breaking of the inversion symmetry either in the bulk or in the device structure. In this talk I will consider a two-dimensional electron gas and review the interplay between extrinsic and intrinsic mechanisms in the spin Hall effect. The work presented here [1, 2, 3, 4] has been done in collaboration with P. Schwab, C. Gorini, and A. Shelankov.

References

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- [3] P. Schwab, R. Raimondi, and C. Gorini, arXiv: 1003.6018.
- [4] C. Gorini, P. Schwab, R. Raimondi and A. L. Shelankov, arXiv:1003.5763.