

Spintronic research with (Cd,Mn)Te-based diluted magnetic semiconductor quantum structures

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Modern applications of II-Mn-VI diluted magnetic semiconductors in spintronic research was limited by the unavailability of appropriate nanostructures with sufficient quality. In my talk I will review recent progress in MBE technology of (Cd,Mn)Te-based nanostructures containing two dimensional electron gas (2DEG) and will discuss already demonstrated applications of such high mobility magnetic-2DEG for: a) THz and microwave radiation induced zero-bias generation of pure spin currents and very efficient magnetic field induced conversion of them into spin polarized electric current [1]; b) clear demonstration of THz radiation from spin-waves excited in DMS via efficient Raman generation process [2]; c) experimental demonstration of working principles of a new type of spin transistor based on controlling the spin transmission via tunable Landau-Zener transitions in spatially modulated spin-split bands [3].

References:

- [1] S. D. Ganichev et al., Phys. Rev. Lett. 102, 156602 (2009).
- [2] R. Rungsaawang et al., Phys. Rev. Lett. 110, 177203 (2013).
- [3] C. Betthausen et al., Science 337, 324 (2012).

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