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Formation Dynamics of Resident Electron Spin Polarization in a Single Quantum Well

By

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Abstract

The resident electron spin polarization (RESP) in quantum wells (QWs) has gained considerable attention for the potential applications of spin degree of freedom in the spintronic devices and quantum information processing. In this talk, I will present our recent studies of the formation dynamics of RESP and ensemble spin coherence in a naturally n-doped CdTe single QW with picosecond laser pulses by time-resolved Kerr rotation (TRKR) method. The careful analysis of TRKR signals as compared to the theoretical fittings around time origin reveals the appealing phenomenon: a negative initial phase shift in the processional motion of RESP. After the detailed experimental studies on the initial phase shift, along with theoretical simulation analysis, the model of the interplay between tritons, neutral exactions and RESP has been confirmed. Consequently, the discussion of initial phase shift and of ensemble spin dynamics gave a full understanding of RESP formation dynamics, initial behaviors, involving the formation and evolution of exactions.

All are Welcome!