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Magnetoswitching of current oscillations in dilute magnetic semiconductor nanostructures

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Strongly nonlinear transport through dilute magnetic semiconductor multiquantum wells occurs due to the interplay between confinement, Coulomb, and exchange interaction. Nonlinear effects include the appearance of spin-polarized stationary states and self-sustained current oscillations as possible stable states of the nanostructure, depending on its configuration and control parameters such as voltage bias and level splitting due to an external magnetic field. Oscillatory regions grow in size with well number and level splitting. A systematic analysis of the charge and spin response to voltage and magnetic field switching of II-VI dilute magnetic semiconductor multiquantum wells is carried out. The description of stationary and time-periodic spin-polarized states, the transitions between them and the responses to voltage or magnetic field switching have great importance due to the potential implementation of spintronic devices based on these nanostructures. ©2009 *The American Physical Society*

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