

SEMINARANKÜNDIGUNG

Dienstag, 16. Dezember 2008

13:00 Uhr

WSI, Seminarraum S 101

„Optical control of a single manganese spin in a quantum dot,,

The decrease of the structure size in semiconductor electronic devices and magnetic information storage devices has dramatically reduced the number of atoms necessary to process and store bit of information. Information storage on a single magnetic atom would be an ultimate limit. Diluted magnetic semiconductor systems combining high quality semiconductor structures and the magnetic properties of Mn atoms are good candidates for these ultimate devices. With the recent development of quantum dots (QDs) doped with single Mn atoms, the optical probing of a single atomic spin in a solid state environment became possible using optical micro-spectroscopy techniques. In this talk, we will show how the photons emitted by an individual CdTe/ZnTe QD containing a single Mn atom ($S=5/2$) can be used to probe the dynamics of the Mn spin. We will also discuss how the optical injection of spin polarized carriers can be a tool to control this localized spin. After a description of the spin structure of the system formed by the interaction between a controlled number of confined carriers and a localized Mn spin we will present photon correlation and time resolved optical pumping experiments on individual QDs allowing probing the dynamics of these few interacting spins.

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