

Abstract Submitted
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The sensitive electrical detection of spin coherence with pulsed electrically detected magnetic resonance CHRISTOPH BOEHME, University of Utah, Physics Department, 115 S 1400 E Suite 201, Salt Lake City, Utah 84112-0830, USA, KLAUS LIPS, Hahn-Meitner-Institut Berlin, Abteilung Siliziumphotovoltaik, 12489 Berlin, Germany — We present a pulsed electrically detected magnetic resonance experiment which allows the very sensitive observation of the coherent evolution of localized electron spins in semiconductors. The experiment takes advantage of spin selection rules of electronic transport transitions which exist for tunneling through localized states of a 20 nm thick disordered silicon buffer layer between a crystalline silicon wafer and an 80 nm thick ZnO surface layer. When coherent spin states of defect pairs are prepared by means of pulsed electron spin resonance, the singlet content (= the projection of density matrix onto the singlet state) of these states is directly proportional to the additional charge which is transmitted by the interface. Experimental data and the sensitivity limits of this spin measurement technique will be presented. The applicability of this for the readout of silicon based spin quantum information concepts is discussed.

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