

Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Electric Dipole Spin Resonance for Heavy Holes in Quantum Dots¹ DENIS BULAEV, DANIEL LOSS, Institute of Physics, University of Basel, CH-4056 Basel, Switzerland — We propose and analyze a new method for manipulation of a heavy hole spin in a quantum dot. Due to spin-orbit coupling between states with different orbital momenta and opposite spin orientations, an applied rf electric field induces transitions between spin-up and spin-down states. This scheme can be used for detection of heavy-hole spin resonance signals, for the control of the spin dynamics in two-dimensional systems, and for determining important parameters of heavy-holes such as the effective g -factor, mass, spin-orbit coupling constants, spin relaxation and decoherence times.

¹We acknowledge support from the Swiss NSF, NCCR Nanoscience, DARPA, ONR, and JST ICORP.

Denis Bulaev
Institute of Physics, University of Basel, CH-4056 Basel, Switzerland

Date submitted: 20 Nov 2006

Electronic form version 1.4