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Spin relaxation in SiGe islands[1] HANS MALISSA, Department of Electrical Engineering, Princeton University, WOLFGANG JANTSCH, GANG CHEN, THOMAS FROMHERZ, FRIEDRICH SCHAFFLER, GUENTHER BAUER, Institute of Semiconductor and Solid State Physics, JKU Linz, Austria, ALEXEI TYRYSHKIN, STEPHEN LYON, Department of Electrical Engineering, Princeton University, ZBYSLAW WILAMOWSKI, Institute of Physics, Polish Academy of Science, Warsaw, Poland — We investigate the spin properties of electrons confined in MBE grown SiGe islands using photoluminescence and electron spin resonance (ESR), the latter both in continuous wave and in pulsed mode. Three dimensional Ge islands are grown on unstructured and structured Si(100) substrates, which leads to strain in the Si layer that is deposited on top, giving rise to electron confinement inside the Si layer above the Ge islands. This growth sequence is repeated up to 12 times in order to obtain a total of more than 10^{10} quantum dots. Under illumination with sub band gap light, we observe a g-factor, ESR line width, and spin lifetimes that correspond to Si conduction band electrons with an additional inhomogeneous broadening.

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Hans Malissa
Department of Electrical Engineering, Princeton University

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