Abstract Submitted
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Magnetic resonance characterization of silicon nanowires[1] MARCO FANCIULLI, Department of Material Science, University of Milano-Bicocca, Italy and MDM Laboratory, IMM-CNR, Agrate Brianza, Italy, MATTEO BELLI, ANTONIO VELLEI, MDM Laboratory, IMM-CNR, Agrate Brianza, Italy, CARMEN CANEVALI, DAVIDE ROTTA, STEFANO PALEARI, MARTINA BASINI, Department of Material Science, University of Milano-Bicocca, Italy — Silicon nanowires (SiNWs) have been extensively investigated in the last decades. The interest in these nanostructures stems from both fundamental and applied research motivations. The functional properties of one- and zero-dimensional silicon structures are significantly different, at least below a certain critical dimension, from those well known in the bulk. The key and peculiar functional properties of SiNWs find applications in nanoelectronics, classical and quantum information processing and storage, optoelectronics, photovoltaics, thermoelectric, battery technology, nano-biotechnology, and neuroelectronics. We report our work on the characterization by continuous wave (CW) and pulse electron spin resonance (CW, FT-EPR) and electrically detected magnetic resonance (EDMR) measurements of silicon nanowires (SiNWs) produced by different top-down processes. SiNWs were fabricated starting from SOI wafers using standard e-beam lithography and anisotropic wet etching or by metal-assisted chemical etching. Further oxidation was used to reduce the wire cross section. Different EDMR implementations were used to address the electronic wave function of donors (P, As) and to characterize point defects at the $SiNWs/SiO_2$ interface.

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