

381

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Title:Magnetic field dependence of the spin relaxation length in spin light-emitting diodes

Authors:Höpfner, Henning (1); Fritsche, Carola (1); Ludwig, Arne (2); Ludwig, Astrid (2); Stromberg, Frank (3); Wende, Heiko (3); Keune, Werner (3); Reuter, Dirk (2); Wieck, Andreas D. (2); Gerhardt, Nils C. (1); Hofmann, Martin R. (1)

Author affiliation:(1) Photonics and Terahertz Technology, Ruhr-University Bochum, Bochum, Germany; (2) Applied Solid State Physics, Ruhr-University Bochum, Bochum, Germany; (3) Faculty of Physics, Center for Nanointegration Duisburg-Essen, University of Duisburg-Essen, Duisburg, Germany

Corresponding author:Höpfner, H.(henning.hoepfner@rub.de)

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Abstract:We investigate the spin relaxation length during vertical electron transport in spin-light emitting diode devices as a function of magnetic field strength at room temperature. In most publications on spin relaxation in optoelectronic devices, strong magnetic fields are used to achieve perpendicular-to-plane magnetization of the spin injection contacts. We show experimentally that high magnetic field strengths significantly reduce spin relaxation during transport to the active region of the device. We obtain a spin relaxation length of 27(3) nm in magnetic remanence and at room temperature, which nearly doubles at 2 T magnetic field strength. © 2012 American Institute of Physics.

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