GaAs Nanowire Linear and nonlinear optical properties

F. M. Matinaga[1]*, A.C.S Pimenta[1], M.V.B. Moreira[1], A.G.de Oliveira[1], J.C. González Pelez[1], M. de Giorgi[2] and D. Sanvitto[2]

[1]University of Minas Gerais, Department of Physics, Av. Antônio Carlos, 6627, Belo Horizonte, MG, Brazil.

[2]Nanotec - Istituto Nanotecnologia - CNR, via Monteroni 73100, Lecce, Italy.

matinaga@fisica.ufmg.br

* Corresponding Author

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Abstract

The wurtzite (WZ) phase appear in uniaxial GaAs structures and present a strong second harmonic generation (SHG) effect.[1] This effect is enhanced in the nanowire structures like free standing GaAs. Some structural effects like broken surface symmetry in zincblend, wurtizite phases, surface recombinations, band energy resonances and the excitons presence are all factors with influence on the linear and nonlinear radiative process.

In this work, time domain photoluminescence and second harmonic generation measurements on GaAs nanowire show surface effects and zincblend/wurtizite phases characteristics. A fast radiative recombination (<70ps) and SHG angular dependence related to the zincblend phases will be discussed in terms of the type II energy structure[2] as well as the surface factor on the nanowire recombination time and SHG process.

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