

Improvement of near-field enhancement with a grating-assisted gold tapered nanoantenna

Gazizov A., Zohrabi M., Kharintsev S., Salakhov M.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

This work is dedicated to the improvement of the near-field enhancement beneath the tip apex due to delocalized plasmons excitation on a sub-wavelength grating engraved on the tip mesoscopic surface. To study conditions of the maximal enhancement we have performed PSO-based optimization of intensity in search space of two parameters. Those parameters are period of the grating and its position in respect to the apex. The grating-patterned tip is illuminated with the incident light with wavelengths of 400 to 1000 nm in our model. All the simulations of electromagnetic waves scattering on the nanoantenna are based on the finite difference time domain method.

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