

Non-local optical response of nanowire-film system: Effect of geometric parameters

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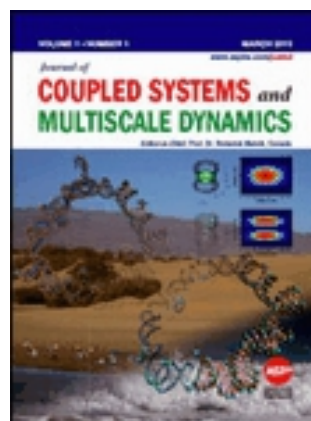
In this paper, we present a computational analysis of the optical response of a nanowire-film coupled system. The numerically computed solution accounts for the non-local hydrodynamic response of the plasmonic media (vacuum). A nanowire-film coupled system consists of a nanowire made of a noble metal such as gold (Au) placed over a film of the same material. Such a system exhibits an optical response that is extremely sensitive to gap between the nanowire and film which makes it favorable for various sensing applications. The nonlocal effect of the plasmonic medium significantly affects the resonant wavelength of the coupled system for structures of small dimensions (less than 10 nm). We present new computational results that can be used to predict the effect of non-locality on the resonances of the system. The results obtained with the model accounting for non-local hydrodynamics response are more accurate and can be applied for ultrafast dynamics in nanoplasmonic system.

Keywords: Coupled models, Gold nanowires, Nanofocusing, Non-local effects, Surface plasmons

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