

Surface plasmon resonance in “monolayer of ni nanoparticles/dielectric spacer/au (ni) film” nanostructure: tuning by variation of spacer thickness

Thursday, 7 February 2019 16:50 (10 minutes)

The dual surface plasmon resonance in Ni nanoparticles in “monolayer of Ni NPs/shellac film/Au (Ni) film” planar nanostructures has been observed in UV-Vis absorption spectra. The dependences of the intensity, wavelength, and width of the dual SPR absorption peaks of Ni NPs coupled with an Au (Ni) film on the spacer thickness have been studied in the range of spacer thicknesses of 12–43 nm. The main features of these dependences are an increase of the intensity, the blue shift, and the monotonic behavior of the widths of SPR absorption peaks at a decrease of the spacer thickness. The observed dependences have been rationalized as a result of the plasmonic coupling of the monolayer of Ni NPs with the metal film and the variation of the dielectric permittivity of the environment of Ni NPs caused by the metal film presence. The stronger dependences of the SPR spectral characteristics of Ni NPs have been observed in the nanostructure containing the gold film comparing to that with a nickel one. Such effect is due to the stronger coupling of Ni NPs with an Au film, and the stronger influence of an Au film on the permittivity of the environment of Ni NPs.

Primary author: Ms TOMCHUK, Anastasiia (Faculty of Physics of Taras Shevchenko National University of Kyiv)

Presenter: Ms TOMCHUK, Anastasiia (Faculty of Physics of Taras Shevchenko National University of Kyiv)

Session Classification: Elevator Speeches