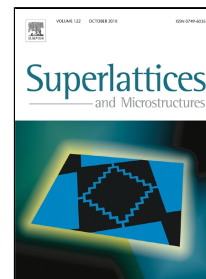


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Fantastic Exciton-plasmon coupling in Dye-doped Poly (vinyl pyrrolidone) /Gold one-dimensional Nano-grating

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Abstract:

The present study aimed to investigate the coupling between the exciton in dye medium and plasmon in gold nano-grating. To this aim, at first, Polyvinylpyrrolidone (Rhodamine B) /Gold nano-grating samples were prepared with different concentrations and thicknesses of dye layer. Then, the spectroscopy of the selected samples was conducted under incident angle modulations and the dispersion diagrams were plotted based on the reflectance spectra. The results revealed the formation of new extra plexcitonic modes as a coupling between exciton and plasmon in the dispersion relation of samples. These new extra modes can be adjusted through the concentrations of the dye layer, the thickness of which is very useful for next generation of plexcitonic devices.

KEYWORDS: Surface plasmon polariton, exciton, dispersion relation, Rhodamine-B, one-dimensional grating.

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