

## Coupling of quantum-well excitons to plasmons in one-dimensional metal nanocylinder gratings

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Theory of plasmon-exciton coupling is developed for a metal nanocylinder grating located in the vicinity of a semiconductor quantum well. In dipole approximation, the effective polarizability of cylinders is derived, taking into account generation of quantum-well excitons in the near field of surface plasmons. Given the polarizability, the spectra of reflection and absorption are calculated for metal-semiconductor systems to study the effect of plasmon-exciton interaction. The excitonic response is shown to be enhanced by high-quality plasmons of Ag cylinders, although strong coupling is not attained for realistic nanostructure parameters.

**Keywords:** plasmon-exciton coupling, nanostructures, metal nanocylinders, resonance splitting.

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