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**Surface-plasmon-polariton band structure of nanostructured multi-layer systems** ERICH RUNGE, Technische Universitaet Ilmenau, Germany, STEPHAN SCHWIEGER, Technische Universitaet Ilmenau, PARINDA VASA, Technische Universitaet Ilmenau, Germany — We calculate the optical response of multi-layer systems where at least one layer contains arrays of metallic substructures of nanometer size. The dependence on lattice constant and excitation energy is studied systematically. An - at first glance non-intuitive - dependence of the plasmon intensity on the geometry of the metallic substructures is observed numerically. Generalizing the work of Park and Lee [PRL 95, 103902 (2005)], the results are interpreted in terms of plasmon-plasmon and plasmon-radiation couplings of different strength. A rich surface-plasmon-polariton bandstructure with “gaps” due to avoided crossings is seen. Super- and subradiant modes are found in the vicinity of those features.

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