Waveguiding in surface plasmon polariton band gap structures

Using near-held optical microscopy, we investigate propagation and scattering of surface plasmon polaritons (SPP's) excited in the wavelength range of 780-820 nm at nanostructured gold-film surfaces with areas of 200-nm-wide scatterers arranged in a 400-nm-period triangular lattice containing line defects. We observe the SPP reflection by such an area and SPP guiding along line defects at 782 nm, as well as significant deterioration of these effects is 815 nm, thereby directly demonstrating the SPP band gap effect and showing first examples of SPP channel waveguides in surface band gap structures.

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