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Tailoring the surface plasmon propagation in subwavelength cylindrical structures HUI KIN KWOK, KIN WAH YU, Department of Physics, The Chinese University of Hong Kong — Tailoring the propagation of surface plasmon polariton (SPPs) in waveguides is useful for subwavelength focusing in photonic circuits. We have studied the wave propagation in an array of subwavelength dielectric cylinders and hollow cylinders immersed in a metallic host. Motivated by Prodan et al.(2003) who proposed the hybridization model for the plasmonic response of cylindrical nanostructures, we extend the study to non-zero off-plane wave number to assess the effect of the hybridizaton of SPP modes on the wave propagation in cylindrical structures. The hybridization of SPP modes of cylindrical multi-layer or multi-array geometry allows us to tailor the SPP propagation through the proper separation of the dielectric components as well as their sizes. By means of the electro-optic effect, the tunable refractive index of the material increases the flexibility on the operating frequency range of the dispersion relation.

Hui Kin Kwok
Department of Physics, The Chinese University of Hong Kong

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