Refractive-Index Sensing with Ultrathin Plasmonic Nanotubes - DTU Orbit (08/12/2018)

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We study the refractive-index sensing properties of plasmonic nanotubes with a dielectric core and ultrathin metal shell. The few nanometer thin metal shell is described by both the usual Drude model and the nonlocal hydrodynamic model to investigate the effects of nonlocality. We derive an analytical expression for the extinction cross section and show how sensing of the refractive index of the surrounding medium and the figure of merit are affected by the shape and size of the nanotubes. Comparison with other localized surface plasmon resonance sensors reveals that the nanotube exhibits superior sensitivity and comparable figure of merit.

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