Plasmonic resonance scattering from silver nanowire illuminated by tightly focused singular beam

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We investigate scattering features of tightly focused singular beams by placing a cylindrical nanowire in the vicinity of a line phase singularity. Applying an illumination wavelength corresponding to silver cylinder plasmonic resonance, we compare the scattering response with that of a perfect conductor. The rigorous modeling employs a 2D version of the Richards–Wolf focusing method and the source model technique. It is found that a cylinder with a plasmonic resonance produces a strong scattering response by deflecting the power flow toward the optical singularity region, where otherwise the power approaches zero.

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