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标题: Characterization of dielectric-coated metallic hollow fiber with subwavelength diameter at terahertz frequency
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摘要: Dielectric-coated metallic hollow fiber (DMHF) is an increasingly popular fiber for the delivery of terahertz (THz) wave. There is a need for small-diameter fibers in a variety of THz wave applications. Transmission characteristics of DMHF with subwavelength diameter in the THz region are numerically investigated. The effective refractive indices, attenuation constants, and power distributions are presented. The effect of the metal layer on enhancing the modal field confinement is demonstrated by comparing the power distribution of the fiber to that of the polymer tube. Attenuation dependence on the dielectric layer is studied concerning the layer thickness and the refractive index. Both the optimal thickness and the optimal refractive index for the dielectric layer are dependent on the core size. Fiber with a smaller core requires a thicker dielectric layer and lower dielectric refractive index to achieve low attenuation. The results are important to the design of subwavelength diameter DMHF for the transmission of THz waves. (c) 2012 Society of Photo-Optical Instrumentation Engineers (SPIE). [DOI: 10.1117/1.OE.51.2.025001]
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