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Title:Design and optimization of low-loss high-birefringence hollow fiber at terahertz frequency
Authors:Tang, Xiao-Li (1); Sun, Bang-Shan (1); Shi, Yi-Wei (1)
Author affiliation:(1) School of Information Science and Engineering, Fudan University, Shanghai 200433, China
Corresponding author:Tang, X.-L.(ywshi@fudan.edu.cn)
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Abstract:Transmission characteristics at terahertz (THz) frequencies are numerically analyzed for elliptical dielectric-coated metallic hollow fiber (DMHF). Attenuation constants, group velocity, modal birefringence, and modal power fraction in the air core are presented. Optimization of the fiber geometry is investigated to reduce the attenuation and to increase the birefringence simultaneously. Modal birefringence of 3.3×10-2 and attenuation of 2.4 dB/m are expected. It is found that a desirable ellipticity of the air core is around 3. And both the modal birefringence and the attenuation constant are inversely proportional to the cube of the core size. Multiple dielectric layers significantly reduce the attenuation and meanwhile have little influence on the modal birefringence.
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