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Title:Reducing transmission losses in hollow THz waveguides
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Abstract:Research on reducing material absorption in Terahertz (THz) waveguides has lead to development of guiding structures with transmission losses as low as 1 dB/m. Among waveguides that exhibit low loss at THz frequencies are the dielectric-lined hollow cylindrical metallic waveguides. Loss reduction in this waveguide is attributed to an ideal profile of the dominant hybrid HE_{11} mode. This mode profile also results in relatively low dispersion and very high coupling efficiency. In this contribution we overview properties of dielectric-lined hollow cylindrical metallic waveguides for THz waves, their design principles and the fabrication process. The impact of the mode profile on losses and dispersion at THz frequencies is confirmed experimentally by THz near-field imaging and THz time-domain spectroscopy and numerically by the finite element method.
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