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Title:Quasi-TEM mode propagation in twin-wire THz waveguides
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Abstract:We numerically investigate the trade-offs between the dispersion properties, coupling efficiency, and geometrical constraints in dual-wire (twin-lead) terahertz (THz) waveguides. In particular, we show that their inherent linearly polarized quasi-transverse electromagnetic (TEM) modes exist for waveguide transverse dimensions comparable with the wavelength, enabling significant end-fire coupling (>10%) for numericalaperture limited Gaussian beams while supporting a relatively low-dispersion propagation of below 0.5 ps2/m, as desired for short-pulse time-domain spectroscopy applications. Starting from the dual-wire structure, we also demonstrate that low-dispersion tapers can be designed to improve coupling efficiency.
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