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摘要: Polymer optical fibres (POF) have historically focused on applications in data transmission over short distances, using highly multimode step-index or graded-index fibre designs. This paper will focus on a qualitatively different type of polymer fibres - microstructured polymer optical fibres (mPOF) - which allow a wider variety of fibre designs and optical properties to be achieved. Fibres with similar properties to conventional step- and graded-index POF can be made for data transmission applications, as well as single-mode fibres which can be used for grating inscription and grating-based sensing. The use of microstructures can also be extended to longer wavelengths for the transmission of THz radiation, and both solid-core and hollow-core mPOF-based THz waveguides have been demonstrated. Finally, the development and extension of mPOF to form metal-dielectric structures for the manufacture of metamaterials using fibre-drawing methods will be discussed. Such drawn-metamaterials with electric and magnetic responses at THz frequencies have been demonstrated.
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