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Accession number:13043794

Title:Terahertz switch and polarization controller based on photonic crystal fiber

Authors:Hou Yu (1); Fei Fan (1); Wang XiangHui (1); Zhao GuoHua (2); Chang ShengJiang (1)

Author affiliation:(1) Key Lab. of Optoelectron. Inf. Sci. & Technol., Minist. of Educ., Nankai Univ., Tianjin, China; (2) Element 90, No. 73146 troop, PLA, Quanzhou, China

Source title:Science China: Information Sciences

Abbreviated source title:Sci. China, Inf. Sci. (Germany)

Volume:55

Issue:1

Publication date:Jan. 2012

Pages:106-13

Language:English

ISSN:1674-733X

Document type:Journal article (JA)

Publisher:SP Science in China Press

Country of publication:Germany

Material Identity Number:GF93-2012-002

Abstract:Theoretical studies on liquid crystal filled photonic crystal fiber (LC-PCF) are presented. The effects of electric birefringence of liquid crystal (LC) in the LC-PCF and the transmitting properties of photonic crystal fiber (PCF) are investigated by using the full vector plane wave expansion and beam propagation method. The simulation results show that the electrically controlled LC-PCF can act as not only a terahertz (THz) switch with about 0.55 THz bandwidth, but also a tunable polarization controller for changing the polarization state of the fundamental mode.

Number of references:26

Inspected terms:holey fibres - liquid crystals - optical switches - photonic crystals

Uncontrolled terms:terahertz switch - polarization controller - liquid crystal filled photonic crystal fiber - transmitting properties - full vector plane wave expansion - beam propagation method - polarization state - frequency 0.55 THz

Inspected classification codes:A4270Q Photonic bandgap materials - A4280M Optical switches - A4281W Other fibre optical devices and techniques - B4110 Optical materials - B4125 Fibre optics - B4185 Optical switches

Numerical data indexing:frequency 5.5E+11 Hz

Treatment:Practical (PRA); Experimental (EXP)

Discipline:Physics (A); Electrical/Electronic engineering (B)

DOI:10.1007/s11432-011-4486-2