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标题: Strontium titanate/silicon-based terahertz photonic crystal multilayer stack

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摘要: A one-dimensional photonic crystal working in the terahertz (THz) range was designed and implemented. To facilitate the design, the transmission properties of strontium titanate crystals were characterized by THz-time-domain spectroscopy. Relatively high refractive index (similar to 18.5) and transmission ratio (0.08) were observed between 0.2 to 1 THz. A stacked structure of (Si d(Si)/STO d(STO))(N)/Si d(Si) was then designed, with transmission spectra calculated by the transfer matrix method. The effects of the filling ratio (d(STO)/(d(Si) + d(STO))), periodicity (d(Si) + d(STO)) and the number of repeats N on the transmission of PC were investigated. The effect of introducing a defect layer was also studied. Based on these, Si/STO multilayers with STO defect thickness of 125 mu m and 200 mu m were measured. The shift of the defect mode was observed and compared with the calculations.

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