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Waveguide coupled surface plasmon resonance based Electro optic modulation in SBN thin films

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Abstract

Modulation of light intensity utilizing waveguide coupled Surface Plasmon Resonance (WCSPR) technique at low driving voltage has been demonstrated in the present work. The high value of electro optic coefficient of Strontium Barium Niobate $Sr_{0.6}Ba_{0.4}Nb_2O_6$ (SBN60) makes it a promising material for the SPR based electro optic modulators. Prism coupling technique has been utilized for the excitation of surface plasmons in Strontium Barium Niobate (SBN) thin film in Otto configuration. Modulation of about 36% is observed due to a significant change in the refractive index of SBN60 thin film on application of electric field of 200kV/cm. The transient response of change in reflectivity of the WCSPR system with electric field indicates the dynamic change of polarization state of SBN thin film.

Keywords: WCSPR, Modulation, SBN, Electro optic

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