2267

Beam deflection and T.I.R switching in domain-engineered $LiNbO_3$

Alexander J Boyland, Sakellaris Mailis, Jason M Hendricks, Peter G R Smith, Robert W Eason
Optoelectronics Research Centre, University of Southampton, Southampton, SO17 1BJ
Tel: 02380594527, Fax: 02380593142, email: ajb@orc.soton.ac.uk

We have developed a novel electro-optically addressable deflector and switch in a sample of $LiNbO_3$. Patterning and electric-field poling produce areas of oppositely oriented domain regions separated by a sharp boundary. An external electric field applied to this boundary produces equal magnitude refractive index changes, Δn, of opposite sign between adjacent domain regions. For increasing Δn, the incident beam experiences deflection, until a critical value is reached when TIR will occur, thereby leading to complete switching of beam direction.

Such a device provides numerous advantages including ease of fabrication, high contrast ratios (TIR is 100% efficient), relatively low drive voltages, large deflections (~8° for an applied field of 1000V), and a wavelength dependence that is superior to other electro-optic devices such as Pockels cells.

We will discuss results achieved for light of *s* and *p* polarisations, for wavelengths in the visible and the near I.R., with initial contrast ratios >20dB.