

## ALL-OPTICAL SWITCHING BASED ON GRATING WRITTEN PHOTOREFRACTIVE SLAB/FIBER WAVEGUIDE COUPLER

Mehmet Salih Dinleyici

İzmir Institute of Technology, Electrical and Electronics Eng. Dept.  
Gülbahçe, Urla, İzmir/Turkey,  
Phone : 90 232 4986575, Fax : 90 232 4986505  
E-mail: [sdinleyi@likya.iyte.edu.tr](mailto:sdinleyi@likya.iyte.edu.tr)

Since all optical switching is a key element for all kinds of optical networks, great amount of works have been dedicated either for material researches or various waveguide structures. Generally speaking the switching time of devices based on photorefractive effect are rather slow for today's high capacity optical fiber networks. In the field of waveguide architecture various geometries have been proposed and investigated for grating assisted or guided optical coupling for the purpose of designing all-optical switch, add/drop multiplexers, filters etc.

In this paper slab/fiber geometry will be investigated for all-optical switching. Here, the slab is a thin layer of polymer or crystal, showing a moderate photorefractive effect, attached to the core of optical fiber. The thickness of the slab is just enough to accommodate the refractive index change depth of the grating which is written externally via an intensity distribution of two coherent beams' interference.

This geometry will be modeled using Coupled Mode Theory and the switching properties (speed, required minimum refractive index change) will be explored and presented.