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Integrated lenses for enhanced coupling into terahertz photonic crystal slab waveguides CRISTO YEE, STEPHEN PARHAM, MARK SHERWIN, Physics Department and Institute for Quantum and Complex Dynamics, University of California Santa Barbara — The fundamental property of a photonic crystal (PC), its optical band gap, can be exploited by the introduction of defects that allow the existence of spatially localized states within the optical band gap. A PC waveguide consist of a line of defects in which the localized states will coalesce to form bands that allow the transmission of light otherwise prohibited. Coupling light directly from a source into the waveguide is restricted by the impedance mismatch of the PC waveguide and the surrounding media. In this work we use integrated lenses to enhance coupling of light into PC waveguides. PC slabs with lattices constants ranging from 56 to 64 microns were fabricated with Reactive Ion Etching on a high-resistivity Si wafer. An narrow band tunable source was employed to measure the transmission trough the waveguides. The results are compared with a full 3D FDTD calculations. This work was supported by NSF under grant CCF0507295 and CONACYT-UCMEXUS.

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