

A Study Of Slow Light In 1D Photonic Crystals

D. Yudistira, H.J.W.M. Hoekstra, M. Hammer, D.A.I. Marpaung

MESA+ Research Institute, University of Twente, The Netherlands

Abstract: Slow light (SL) states corresponding to wavelength regions near the bandgap edge of grating structure are known to show strong field enhancement. Such states may be excited efficiently by well-optimised adiabatic transitions in such structures, e.g., by slowly turning on the modulation depth. To study adiabatic excitations, a detailed research in 1D is performed to obtain insight into the relation between the device parameters and properties like enhancement and modal reflection. The results enable the design of an adiabatic device for efficient excitation of SL states in 1D. In addition of that, the effects of small wavelength variations as well as that of small fluctuations in the modulation depth of the grating have been investigated.

Keywords: Slow light, Photonic crystals, Field enhancement.

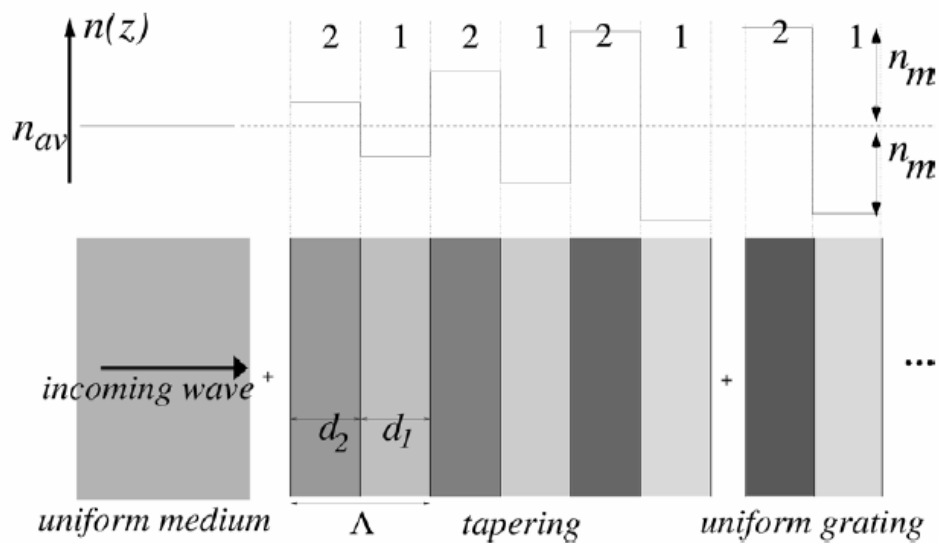


Figure 1: Refractive index as a function of z of 1D grating with a tapered index modulation.