

ABSTRACT

SANCHÍS JORGE, Francisco Simón. Study of *modal perturbation method applied to laminar dielectric structures*. 315f. Dissertação (Mestrado em Engenharia Eletrônica) – Faculdade de Engenharia, Universidade do Estado do Rio de Janeiro, Rio de Janeiro, 20016.

In this work the coupling between dielectric waveguides is analyzed using the modal perturbation technique (mode coupling). The approach is general, thus, applicable to any kind of structures constituted by different kinds and numbers of dielectric waveguides. Fundamental factors related to the coupling between waveguides are calculated and some of the structure results compared to those published in the literature. Although the theory is general, in this study, were just analyzed coupled dielectric slabs. The reason for this approach is to reach a perfect understanding about the applicability of the method, for, in future works, be able to apply it in more complex structures; fonic crystals; coupling between several optic fibers, etc. The effective permittivity method was also developed, without restrictions, with the purpose of completing the programming of the modal perturbation method, related to the analysis of isolated slabs.

Keywords: Modal perturbation method; Dielectric slabs; Dielectric waveguides; Effective permittivity method; Low contrast; High contrast; Coupled-mode.