

Wave Propagation in a 2-D Optical Waveguide*

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Dedicated to the memory of Ralph E. Kleinman (1929-1998)

Abstract

In this work, we consider a wave propagation problem in a 2-D waveguide. The problem arises in the study of light in optical fibers. We construct a transform theory as a framework for studying this problem. An explicit representation for the solution to problems involving light sources is derived. We derive a decay rate for the non-guided part of the solution in the direction of the core. The approach is also amenable to computations, and we demonstrate this in numerical examples for the case of slab waveguides.

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