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THE PRINCIPLE OF LIMITING ABSORPTION FOR PROPAGATIVE SYSTEMS IN CRYSTAL OPTICS WITH PERTURBATIONS OF LONG-RANGE CLASS

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§ 1. Introduction

The present paper is a continuation of [10] where we have proved the principle of limiting absorption for uniformly propagative systems with perturbations of long-range class. In this paper, we consider the Maxwell equation in crystal optics as an important example of non-uniformly propagative systems and, under the same assumptions on perturbations as in [10], we prove the principle of limiting absorption for the stationary problem associated with this equation by using a way similar to that in [10]. We here restrict our consideration to a very special class of non-uniformly propagative systems, but the method developed in this paper will be applicable to more general systems for which non-zero roots of characteristic equations of unperturbed systems are at most double. For another works on the spectral and scattering problems for non-uniformly propagative systems with perturbations of short-range class, see [1], [5], [6], [7] and [8], etc.

1.1. Notations. We first list up the notations to be used throughout our entire discussion.

(1) We work exclusively in 3-dimensional euclidean space R^3_x with generic point $x = (x_1, x_2, x_3)$. R^3_ξ denotes the 3-dimensional space dual to R^3_x and the generic point ξ in R^3_ξ is denoted by $\xi = (\xi_1, \xi_2, \xi_3)$. We further denote by $x\cdot\xi$ the scalar product between x and ξ; $x\cdot\xi = \sum_{j=1}^3 x_j\xi_j$.

(2) C^k denotes the k-dimensional unitary space with the usual scalar product $(,)$. (In this paper, the notation $(,)$ is used only for $k = 6$.)

(3) For a multi-index $m = (m_1, m_2, m_3)$, m_j being a non-negative integer, we denote by $|m|$ the length of m. We write $\partial_x = (\partial/\partial x_1, \partial/\partial x_2, \partial/\partial x_3)$, $D_x =$

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