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**On the expression of the field scattered by a multimode plane.** (English) Zbl 1244.76107

Q. J. Mech. Appl. Math. 63, No. 3, 237-266 (2010).

Summary: The field scattered by a plane composed of several homogeneous layers on a perfectly reflecting plane is generally given by its plane wave expansion (Fourier representation). We here develop another approach to express the field, more suitable for point source illumination. For this, we sum the contributions of modes corresponding to zeros  $g_j$  (or poles  $-g_j$ ) of the reflection coefficient of the imperfectly reflecting surface, developing an original integral representation and its expansions, valid for arbitrary mode which can be passive or active. Particular attention has been paid to active modes with  $\text{Re}g_j < 0$ , and to the vicinity of the mode with  $g_j = -1$ . We then obtain novel exact expressions for the field in acoustics and for potentials in electromagnetism.

**MSC:**

**76Q05** Hydro- and aero-acoustics

**74F10** Fluid-solid interactions (including aero- and hydro-elasticity, porosity, etc.)

**78A45** Diffraction, scattering

Cited in 1 Document

**Keywords:**

active mode; passive mode; reflection coefficient; integral representation

**Full Text:** [DOI](#)