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The paper presents results of analytical and numerical investigations of a plane acoustic waves propagation through a plane layer surrounded by another medium. The wave generation problem is discussed. The mathematical model of the pressure propagation in the layer is proposed. Propagated through the layer changes in pressure, the reflected and transmitted waves were studied. Some results of numerical investigations are presented.

INTRODUCTION

The wave generation and propagation inside layers with different physical properties is very important problem in practice. The problem considered in this paper is shown in Fig. 1. We assume that plane layer (region II) with density ρ_2 and sound velocity c_2 is placed between $x=0$ and $x=L$. This layer is surrounded by medium with density ρ_0 and sound velocity c_0 (regions I and III). In region I ($x < 0$) the acoustic field consists of incident p_1 and reflected p_r waves. In region II ($0 < x < L$) only transmitted wave p_t is propagated. The pressure field in region II ($0 < x < L$) is formed by the right-going p_2 and left-going p_3 waves ($p = p_2 + p_3$).



Fig. 1. Sketch of the problem