MAGNETOELASTIC WAVES IN MULTILAYERS

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S u m m a r y

The theory of the spectrum of coupled spin and elastic waves in the one-dimensional magnetoelastic multilayer structure is developed. The multilayer structure consists of alternating thin magnetic layers of two different single-axis ferromagnets, being isotropic in magnetic and magnetoelastic properties. It is supposed that the external magnetic field, vectors of magnetization in the layers, easy axes of the anisotropy, and wave vector are perpendicular to the surfaces of the layers. The general form of the dispersion law for coupled waves are obtained analytically and studied numerically. It is shown that a new type of gaps in the spectrum caused by the mutual action of the magnetoelastic coupling and periodicity of the system exists. The analytical equations for the dispersion law are analyzed in detail for a number of cases in the long-wave approximation ($kl \ll 1$, where k is the wave number, l is the structure period). It is shown that the spectrum of elastic and magnetostatic waves in the multilayer structure with alternating magnetic and nonmagnetic layers is described by the common dispersion law. This testifies to that the magnetoelastic coupling leads to a possibility of transferring the magnetic excitations through the nonmagnetic layers.