Spin-wave peculiarities of acoustics of semi-infinite ferromagnet (antiferromagnet) in static external magnetic field

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The study of the necessary conditions for localization of elastic wave near the boundary of magnetic and nonmagnetic mediums under external magnetic field plays important value for designing of the tunable magnetic phononic crystal. Our investigation shows that a traditional approach to the calculation of a Parekh wave [1] only on the base of magnetoelastic and magnetodipole interaction inadequately describes the spectrum of the surface elastic wave in the high-frequency range. It is determined that the magnetostriction plays an important role for high-frequency surface magnetoelastic dynamic of ferromagnet or antiferromagnet. The necessary conditions for existence of the "new" Parekh wave and for amplification of evanescent SH wave and leaky Parekh wave are derived

References:

[1] 1.J.P.Parekh, Electron.Lett 6, 322 (1969)