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Strong coupling of magnetization dynamics of two antiferromagnetic layers by phonons

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Abstract

Strong and long-range coupling of the magnetization dynamics of the two antiferromagnetic layers mediated by the phonons transferred through a nonmagnetic insulator has been investigated. The magnetization dynamics in one of the antiferromagnetic layers via a magnetoelastic interaction leads to the excitation of phonons and their pumping to the nonmagnetic layer. The transfer of phonons, which carry angular momentum, through a nonmagnetic insulator from one antiferromagnetic layer to another, leads to an interference pattern in the absorption spectrum, which represents the coupling of magnetization dynamics of two layers.

Keywords: antiferromagnet, magnetoelastic interaction, magnon-phonon coupling.

For full article, refer to the Persian section