

Transmission of spin waves through a layer of incommensurate magnetic material

A.N. Kuchko,¹ V.N. Krivoruchko,² F.B. Mushenok,³ and V.V. Kruglyak³

¹*Institute of Magnetism of the NAS of Ukraine,
36b, Vernadsky Str., 03142, Kiev, Ukraine*

²*Donetsk Institute for Physics and Engineering the NAS of Ukraine,
46, Nauki Avenue, 03028, Kyiv, Ukraine*

³*University of Exeter, Stocker road, Exeter, EX4 4QL, UK*

Incommensurate magnetic structures are an exotic type of magnetic materials in which the periods of the magnetic and crystal lattices differ by more than an order of magnitude. Currently, the exotic and complex micromagnetic states and dynamic characteristics observed in such structures attract enormous attention of both theorists and experimentalists, offering numerous opportunities for design of novel magnonic devices. In this work, we will report on a theoretical study of the peculiarities of spin wave propagation through and scattering from a layer of incommensurate magnetic material sandwiched between two commensurate (i.e. conventional) magnetic materials. Analytical expressions for the scattering coefficients will be presented and analyzed.

This work was supported by the MagIC project: 644348-H2020-MSCA-RISE-2014.