

Magnon-phonon interactions in magnetic insulators

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We address the theory of magnon-phonon interactions and compute the corresponding quasiparticle and transport lifetimes in magnetic insulators, with a focus on yttrium iron garnet at intermediate temperatures from anisotropy- and exchange-mediated magnon-phonon interactions, the latter being derived from the volume dependence of the Curie temperature. We find in general weak effects of phonon scattering on magnon transport and the Gilbert damping of the macrospin Kittel mode. The magnon transport lifetime differs from the quasiparticle lifetime at shorter wavelengths.