

Spin Mechanics 4



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Cavity Electrodynamics of Magnons

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Hybrid magnonic systems have emerged recently as an important approach for coherent information processing. The great tunability and long lifetime make magnon an ideal information carriers. We demonstrate, that particularly in magnetic insulator yttrium iron garnet (YIG), the coupling between magnon and microwave photons can reach the strong and even ultrastrong coupling regime thanks to the large spin density in YIG. Moreover, since YIG possesses excellent mechanical and optical properties, we show that by leveraging strongly coupled cavity magnonics system, coherent coupling between magnon and phonon, between magnon and optical photons can be all realized. Our work firmly establishes the great potential of magnons as an information transducer that can support coherent information inter-conversion of information carrier among different physics domains.

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