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【409】 Cavity-mediated coupling of terahertz antiferromagnetic resonances in distant crystals

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In the regime of strong light-matter coupling, polaritons are formed that are hybrids of a cavity mode and a matter excitation. Recently, magnon-polaritons were researched using ferromagnets in the microwave range. Exploring antiferromagnets rises magnon-polariton frequencies into the terahertz range. We report on coupling of antiferromagnetic resonance (AFMR) in two parallel-plane crystals of hematite ($\alpha\text{-Fe}_2\text{O}_3$) placed at a well controlled gap, forming a tunable Fabry-Perot cavity. Frequency of AFMR in each crystal was independently controlled by changing their temperatures. Reflection spectra in the range 0.2-0.3 THz, collected as a function of temperature difference between the two crystals, show avoided crossings of AFMR from both slabs mediated by Fabry-Perot cavity modes.

Theoretical Work

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