

Cavity optomechanics: Nonreciprocity and synchronization

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Cavity optomechanics is a rapidly-growing field in which mechanical degrees of freedom are coupled to modes of the electromagnetic field inside electromagnetic resonators. I will give an overview of recent highlights.

I will first discuss nonreciprocal transmission between two microwave modes in an electromechanical circuit using synthetic magnetic field and reservoir engineering [Nature Communications 8, 604 (2017)].

I will then discuss synchronization in some of the simplest quantum-mechanical settings, that of a nonlinear self-oscillator coupled to a drive [PRL 117, 073601 (2016)] and that of quantum synchronization blockade [PRL 118, 243602 (2017)].