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Classical oscillators for understanding quantum descriptions of mechanical systems CHIAO-HSUAN WANG, JQI/University of Maryland, JACOB TAYLOR, JQI/NIST — Optomechanics has been successfully applied to systems involving wide range of scales from as small as 10^{-21} g for atomic level objects like cold atoms to as large as 10^3 g for macroscopic scale systems like LIGO project. As the size of the mechanical object getting larger, more degrees of freedom come in and the quantum harmonic oscillation treatment of optomechanics becomes questionable. We propose models to show that spring-like classical oscillators may occur at large scale, and they describe methods for distinguishing between quantum harmonic oscillations and other oscillatory behavior.

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