Dynamics of Nanomechanical Metamaterials: Pico-vibrometry with Light and Electron Beams

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Abstract

We report on the detection and quantitative mapping of picometre (sub-atomic) amplitude, thermal (phonon-induced) and driven movements in photonic nanostructures, using light and electron beams. These techniques enable measurements of the dynamic mechanical properties that underpin the functionality of a growing range of micro/nano-opto-mechanical (meta)materials, devices, sensors and systems, and present new opportunities in the exploration of fundamental nonequilibrium (opto)mechanics.

Acknowledgements

This work is supported by the UK Engineering and Physical Sciences Research Council (Grant No. EP/M009122/1) and the Singapore Ministry of Education (Grant No. MOE2016-T3-1-006).