

*This manuscript has been previously reviewed at another Nature Research journal. This document only contains reviewer comments and rebuttal letters for versions considered at Communications Physics.*

REVIEWERS' COMMENTS:

Reviewer #1 (Remarks to the Author):

In this work, the authors report on the optomechanical coupling between a silica microsphere cavity and a InP/InAs free-standing nanowire (NW). The evanescent optomechanical coupling has made it possible not only to probe the mechanical motion of the NW but also to modulate the mechanical resonance properties, including Duffing mechanical nonlinearities. Such a combination of an ultrasmall compound semiconductor NW and an optical cavity with a very high quality (Q)-factor will be a new platform for future quantum hybrid systems. In particular, an optomechanical coupled system using a III-V semiconductor nanowire is promising for realizing novel quantum hybrid interfaces for photons, excitons, and phonons through electron-phonon interaction (deformation potential, piezoelectric coupling), particularly, when the system approaches the quantum limit. Since this work is presenting a feasibility of such a new optomechanical platform, I recommend the publication of this paper in Communications Physics.