Cavities for light and sound: a cavity-enhanced platform for quantum acoustics

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Stellingen

Behorend bij het proefschrift

Cavities for light and sound:

A cavity-enhanced platform for quantum acoustics

1. Using an interdigital transducer for both excitation and detection of surface acoustic waves limits full characterization of a cavity and may yield misleading results.
   Chapter 2 of this thesis.

2. A Michelson interferometer, sometimes, can be replaced by a single-mode fiber circulator.
   Chapter 3 of this thesis.

3. Optical measurement of GHz surface acoustic wave displacements requires knowledge of the beam spot size. *Chapter 2 of this thesis.*

4. Mechanical low-pass filters for stabilization of open-access optical microcavities are often incompatible with free-space optical access. *Chapter 5 of this thesis.*

5. In agreement with Ryou & Simon, we find that modal analysis of a complex mechanical system cannot be performed using only a piezoelectric actuator.
   Ryou & Simon, Rev. Sci. Instrum. 88, 013101 (2017).

6. Cavities for quantum applications should be described in terms of finesse and not quality factor. *DeCrescent et al., Phys. Rev. Applied 18, 034067 (2022).*

7. Tomm et al. demonstrated that single-photon sources based on tunable open-access optical microcavities are among the best in the world; however, they are unlikely to be employed in real-world applications. *Tomm et al., Nat. Nanotechnol. 16, 399 (2021).*

8. Highly reflective surface acoustic wave mirrors are incompatible with cavity-enhanced quantum acoustics effects. *Schuetz et al., Phys. Rev. X 5, 031031 (2015).*

9. Working towards quantum experiments often leads to beautiful discoveries in classical physics.

10. The scarcity of consistent rewards in scientific research often drives scientists to work with a sense of urgency, potentially at the expense of their mental well-being.

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