Abstract Submitted
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Towards observation of radiation pressure shot noise at acoustic frequencies CHRISTIAN PLUCHAR[1], University of Arizona — Radiation pressure shot noise (RPSN) fundamentally limits optical displacement measurements but is also a resource for generating optomechanical quantum correlations. We have built a device which consists of an ultra-high-Q silicon nitride "trampoline" resonator placed inside a high finesse optical cavity, designed to detect RPSN at 1 – 100 kHz. Observing RPSN in this frequency band is interesting for a variety of "quantum sensing" applications, as well as searches for fundamental weak signals such as ultralight dark matter. I will discuss the challenges we've faced in attempting to observe RPSN with this system at room temperature, including the large thermal motion of
the resonator, degradation of the mechanical Q, and laser noise, along with the device's prospects as a quantum-enhanced accelerometer.

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