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Unconventionally blocking photons in a three-mode optomechanical cavity with Kerr type nonlinearity[1] AVTEJ SETHI, ASHWIN MISHRA, Miami University — The production of light states with a fixed number of photons is useful for several quantum technologies including quantum cryptography and quantum imaging. Typically, cavity QED systems with strong light-matter interaction can serve as photon turnstiles [2] making use of the conventional photon blockade. It turned out that the same goal can also be achieved at the two-photon level using the unconventional photon blockade (UPB) [3] while making use of the destructive interference between photon pathways. Recently, Sarma et al. [4] have analyzed the optimal conditions to achieve the UPB in a single three-mode optomechanical cavity subjected to a weak drive. In this work, we extend their work to two such optomechanical cavities where optical modes of the cavities are coupled. With two-photon truncation, we analytically address the question that how the cavity-cavity coupling can impact the optimal parameter regime to observe UPB.

[1]Physics Department, Miami University
[2]Science, 319, 5866, 1062-1065 (2008).
[3]Phys. Rev. Lett. 104, 183601 (2010).
[4]Phys. Rev. A 98, 013826 (2018).

Avtej Sethi
Miami University

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