

Abstract Submitted
for the DAMOP17 Meeting of
The American Physical Society

A novel nanophotonic platform for optomechanics in the strong coupling regime ADITYA G DATE, California Institute of Technology, M M TORUNBALCI, Purdue University, JIALUN LUO, CLAIRE WARNER, HIL F H CHEUNG, YOGESH S PATIL, Cornell University, SUNIL BHAVE, Purdue University, MUKUND VENGALATTORE, Cornell University — We describe the realization of a novel microtoroidal resonator for optomechanics in the strong coupling regime. Owing to its design and material properties, the microresonator exhibits low mechanical and optical dissipation leading to strong interactions between its mechanical and optical whispering gallery modes. In addition to the conventional optomechanical control via a nanofiber interface, this device also enables the strong coupling between nanomechanical motion and the collective spin of an ultracold atomic gas. We describe the fabrication and characterization of this device and discuss prospects of beyond-SQL rotation sensing and optical synchronization of the resonator to a microwave transition of the ultracold gas.

Yogesh Patil
Cornell University

Date submitted: 28 Jan 2017

Electronic form version 1.4