

Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

High quality optical and mechanical properties of a dispersive optomechanical device ANDREW JAYICH, BENJAMIN ZWICKL, CHENG YANG, JACK HARRIS, Yale University — We have characterized the optical and mechanical properties of a high finesse Fabry Perot cavity ($F=17,000$) dispersively coupled to a micromechanical SiN_x membrane. The membrane's fundamental and higher-order vibrational modes show quality factors above 10^6 and a spectrum corresponding to a simple drumhead model. The optical cavity's transverse and longitudinal spectrum is also in agreement with theory. We find that the cavity's full transmission and reflection properties can be modeled quantitatively once the membrane's small optical loss is accounted for. We will discuss the role of avoided crossings between higher-order optical modes in this system, particularly within the context of potential QND measurements of micromechanical devices.

Andrew Jayich
Yale University

Date submitted: 27 Nov 2007

Electronic form version 1.4