Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Optical coupling of air-suspended carbon nanotubes to silicon microdisk resonators[1] S. IMAMURA, R. WATAHIKI, R. MIURA, T. SHIMADA, Y.K. KATO, The University of Tokyo — Optical coupling of individual air-suspended single-walled carbon nanotubes to whispering-gallery modes in silicon microdisk resonators is studied. We fabricate silicon microdisks with diameters of $\sim$3 μm on SiO_2 supporting posts from silicon-on-insulator substrates, and synthesize carbon nanotubes from patterned catalysts by alcohol chemical vapor deposition to suspend them onto the microdisks. Interactions between carbon nanotubes and evanescent fields of microdisk modes are investigated by microspectroscopy at room temperature. We observe microdisk modes with quality factors of $\sim$3000 at wavelengths longer than those of silicon emission, even at positions that are a few micrometers from the suspended carbon nanotubes. In addition, as microdisk modes also exist at excitation laser wavelengths, the photoluminescence intensity can be resonantly enhanced by tuning the laser wavelength to those modes.

[1]This work is supported by SCOPE, KAKENHI, and The Asahi Glass Foundation.

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Date submitted: 02 Nov 2012 Electronic form version 1.4