Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

How to Extract Luttinger Liquid Velocity from Carbon Nanotubes DARRYL H. NGAI, Cornell University, CHANG-YU HOU, Universiteit Leiden, EUN-AH KIM, Cornell University — We propose direct detection of Luttinger Liquid velocity of the charge collective mode in carbon nanotubes using optical conductivity and Coulomb blockade effect. We note that detection of such fractionalized excitation needs to exploit the energy or frequency scale tied to the finite length of the nanotube. This is why previous experimental attempts have been unsuccessful.[1] We will discuss features in the optical conductivity sensitive to the velocity of the collective mode which would be observable in the high temperature limit. In the low temperature limit, spacing between the Coulomb blockade peaks in the conductance as a function of gate voltage will be a sensitive probe.

[1]Z. Zhong *et al.*, Nature Nanotechnology **3**, 201 (2008)

Darryl H. Ngai
Cornell University

Date submitted: 27 Dec 2010 Electronic form version 1.4