

2016 TOMODACHI STEM Final Presentation

Modulation of optical property of carbon
nanotubes applying electric field

Kosuke Okada
Prof.Kono Lab

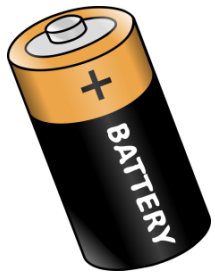
Background

19th century
Iron

20th century
Silicon

21st century
Nano Carbon

Energy



Material



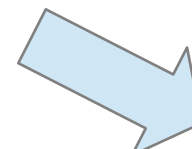
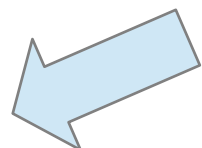
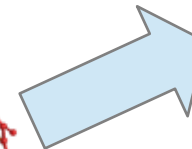
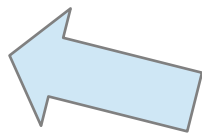
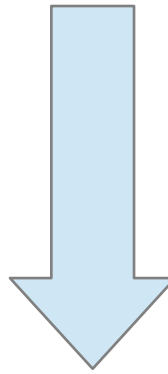
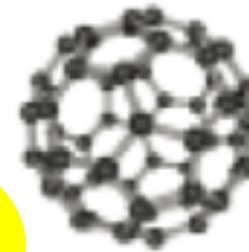
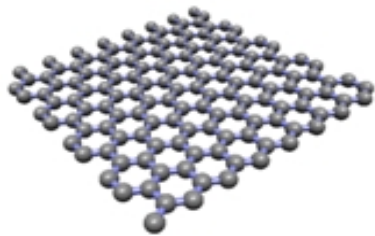
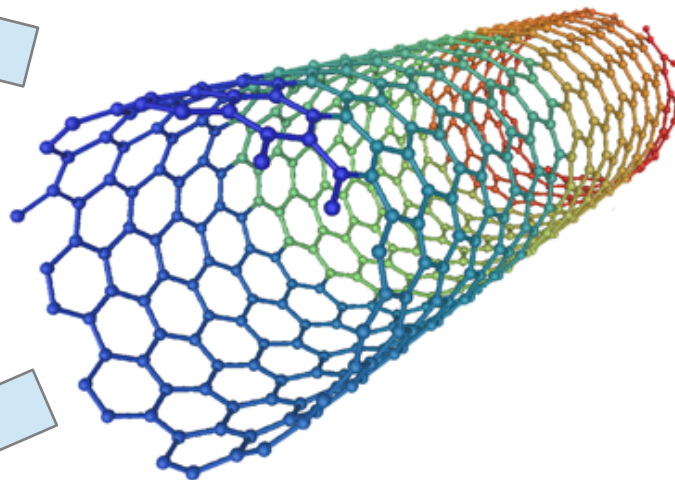
Electronics



Biotechnology



Carbon Nanotube (CNT)

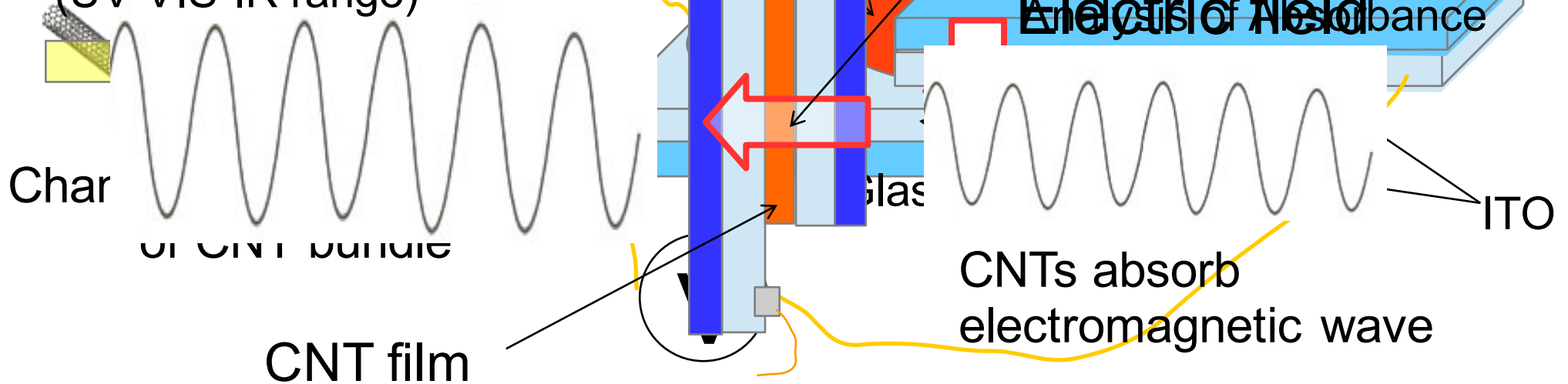


Experiment

Simulation results shows...

Applying E fields

Electromagnetic wave
(UV-VIS-IR range)



Two types of sample

- Mixture of different chiralities of CNTs
- (6,5) CNTs (semiconducting)

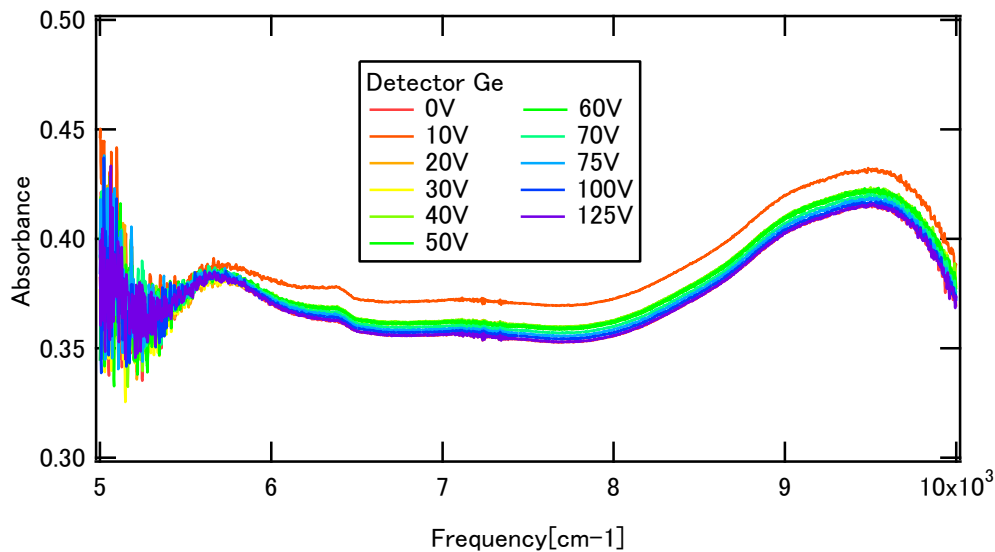
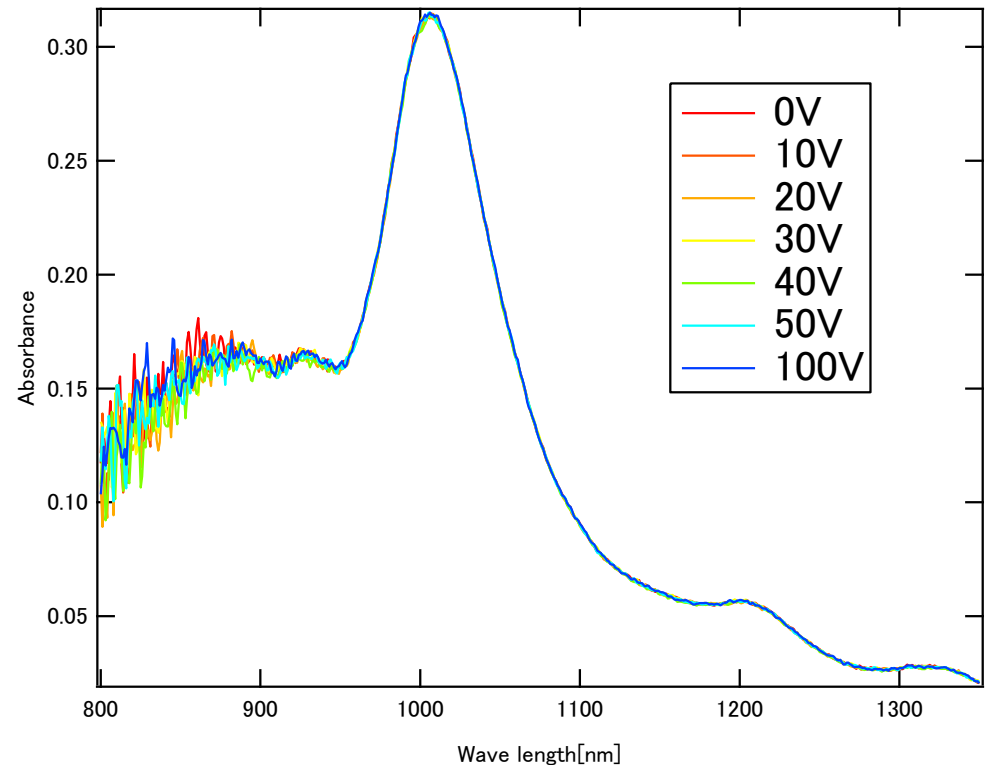
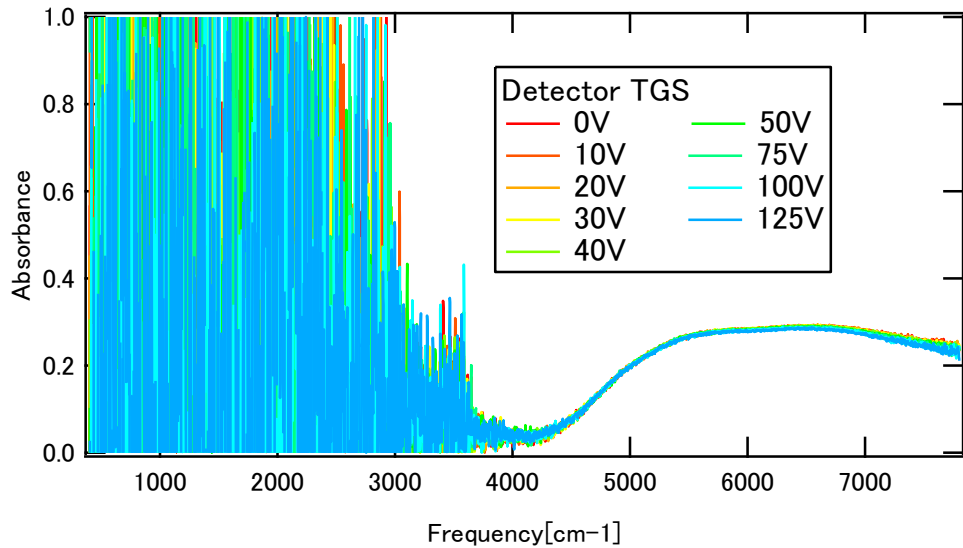
Measurement of Absorbance spectra

- UV-VIS-NIR Spectroscopy
- Fourier Transform Infrared Spectroscopy

Result

(6,5)CNTs

Mixture of CNTs



No peak shift

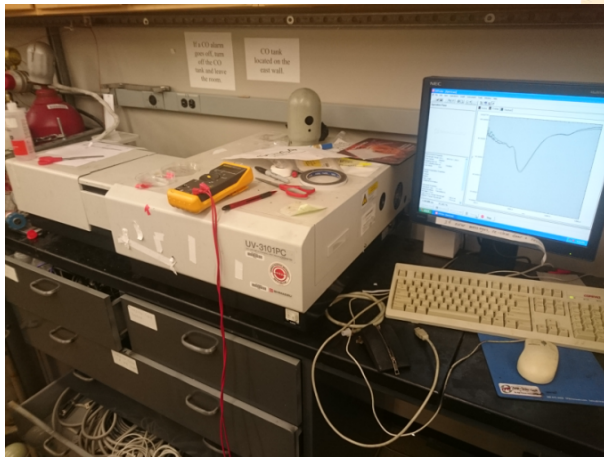
→ Higher electric field is needed?

→ Nullifying the field effect

→ by leak current between electrodes

The U.S. vs. Japan

**In the U.S.,
Collaboration between Laboratories is very active**



Leading to good results!

Experience in the U.S.

@ Kono Laboratory

Sightseeing in Houston

Thank you, Rice!
Thank you, Houston!!

