EE/CprE/SE 491 WEEKLY REPORT 7 - sdmay18-24

10/15/17 – 10/21/17

Project title: Optical force transducer for visualizing cell mechanotransduction in 3D

Client: LIOS Lab
Advisor: **Prof Meng Lu**

Team Members/Role:
Quan Wang --- fabrication and process development
Yalun Tang --- fabrication and process development
Jiameng Li --- theory and numerical modeling
Qinming Zhang --- theory and numerical modeling

o **Past week accomplishments**

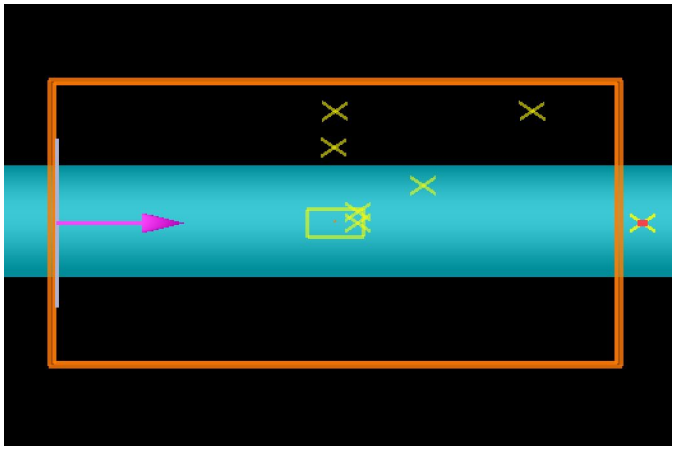
- Yalun Tang:

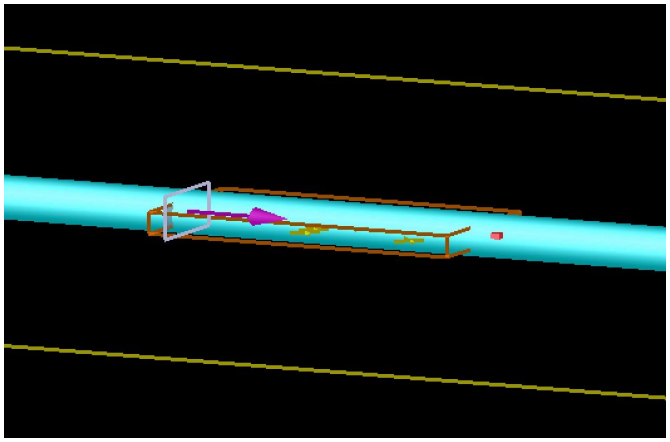
1. Removed the coating from the end of the one-meter fiber which we installed an connector
2. Finish the surface chemistry for that fiber then attach the gold nanoparticles
3. Coupled that fiber with laser then observe the bare part under the microscope. Got the expected result that the diameter of the cladding is so thick that the induced evanescent field could not penetrate it

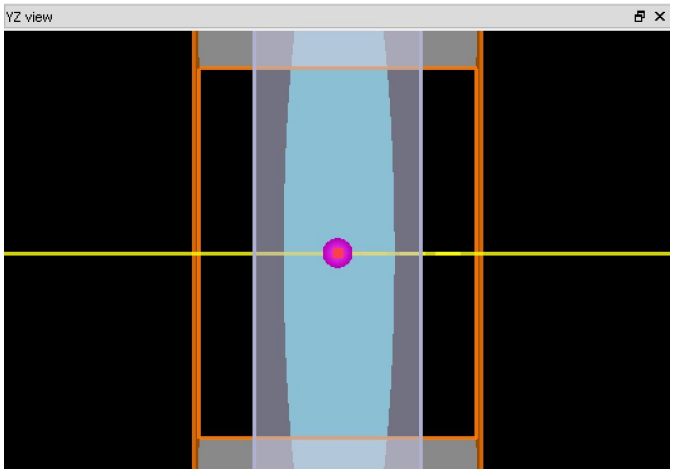
- Quan Wang:

1. Started the third trail of surface chemistry, attaching the gold nanoparticles onto the single mode optical fiber which have a connector installed at the tip
2. Finished coupling the fiber with the laser
3. Tried to stabilize the fiber tip with hand-made tool

- Jiameng Li:
  Finishing design simulation model in 3D version, I set up a calculating frame, inside of it, lighting source, monitor should be located in the frame, so that we get the result from monitor. Since this is a 3D model, the calculating capacity is limited, so we selected a part of fiber to calculate.







- Qinming Zhang:

1. 3D version structure accomplished.
2. Etching platform holder was improved and finished.
3. Learned how to use to machine tool to make relevant equipments.

o **Pending issues**

1. Need the permission from MRC to perform wet etching by 49% HF to remove the cladding

o **Individual contributions**

Team member	Contribution	Weekly hours	Total hours
Yalun Tang	Removed the coating of an optical fiber; Performing surface chemistry on it; Attached gold nanoparticles and observed it under microscope	8	43
Quan Wang	Removed the coating layer of an optical fiber; finished 3rd trail of surface chemistry; attached gold nanoparticles onto the single mode fiber	8	43
Jiameng Li	Simulation model transferred from 2D to 3D has been finished.	5	40
Qinming Zhang	Etching platform has been made; 2D version has been changed to 3D version.	6	41

o **Plan for coming week**

- Yalun Tang and Quan Wang(fabrication):

1. Conduct the wet etching for removing the cladding from the optical fiber after the etching platform are finished by ETG

- Jiameng Li and Qingming Zhang(simulation and modeling):

1. We are going add certain metal spheres under the fiber during the simulation process.
2. We will put test simulated fiber without metal ball's influence, and we want to get visualise wave chart compare with the chart in the textbook.
3. We will put metal ball in the FDTD calculating frame, and we want to see the field distribution when the metal ball is in a specific location.

O **Summary of weekly advisor meeting**

The meeting is cancelled in this week.