

EE 492 Weekly Report 4

MAY15-29 Week 7&8 2/23/2015 - 3/8/2015

Advisors: Meng Lu **Client:**

Members (roles): Wenbing Ma(Detection Part), Xuan Zhang (Detection Part, Webmaster) , Zhikai Cui (Leader, Detection Part), Chenyin Liu(Generation Part, Documentation), Jiangxiang Zhang (Generation Part)

Project Title: Ultrasonic detector using photonic crystals

Weekly Summary : For this two weeks, we etch the photonic crystal sensor to get the best reflection rate at the best wavelength. and then do the first test for the 40kHz acoustic wave transducer for the detection.

Meeting notes:

2/25 & 3/4 Group Meeting with Advisor Dr. Lu Meng

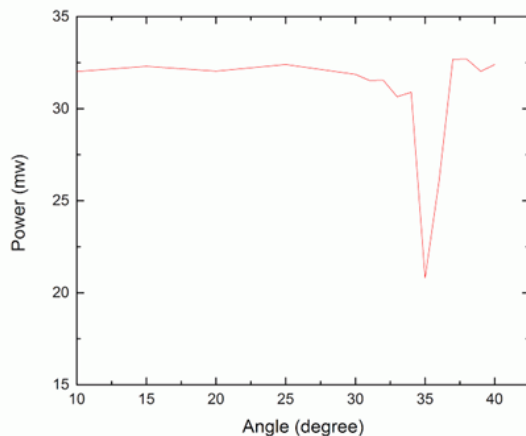
Duration: 60min

Members Present: All

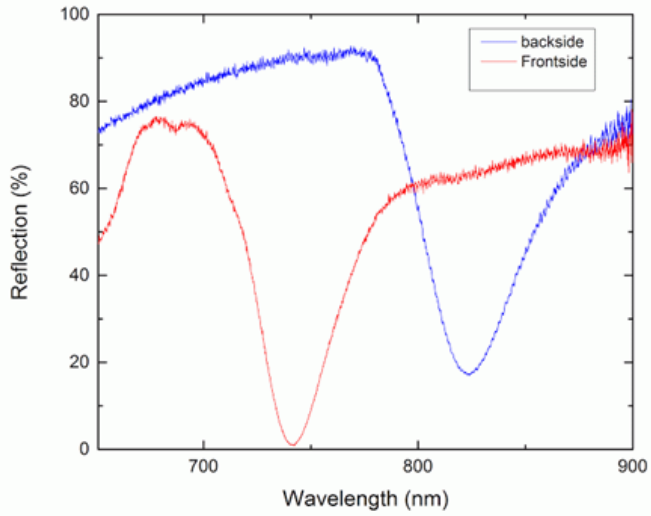
Achievements:

1. Members in this week got the different waveform in different condition. We have got the wave in the original power, frontside and backside in water-500nm white light, in adjuste angle, and frontside in water-600nm. We found that after angle adjustment, it seems the deep move out of detecting range of transducer.

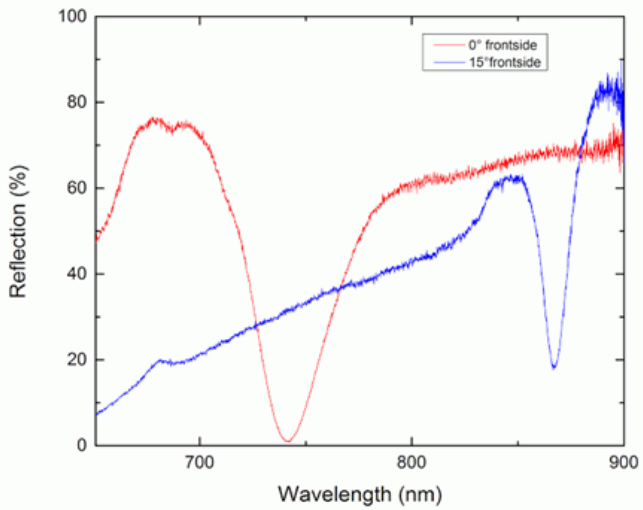
power-500nm laser



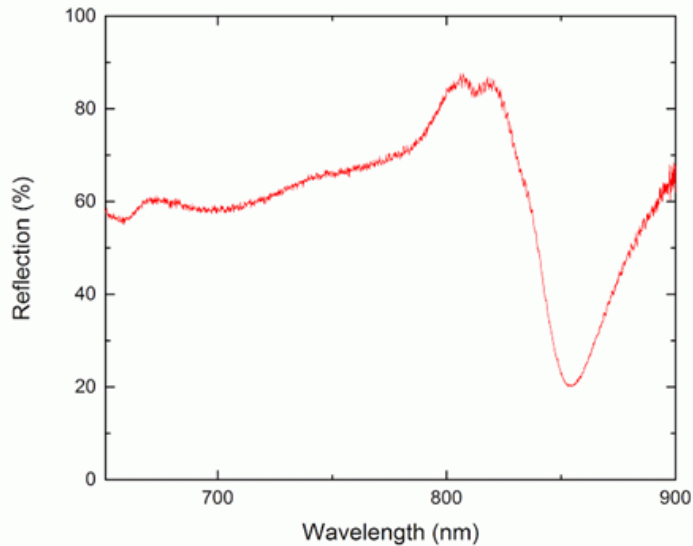
frontside and backside in water - 500nm whitelight



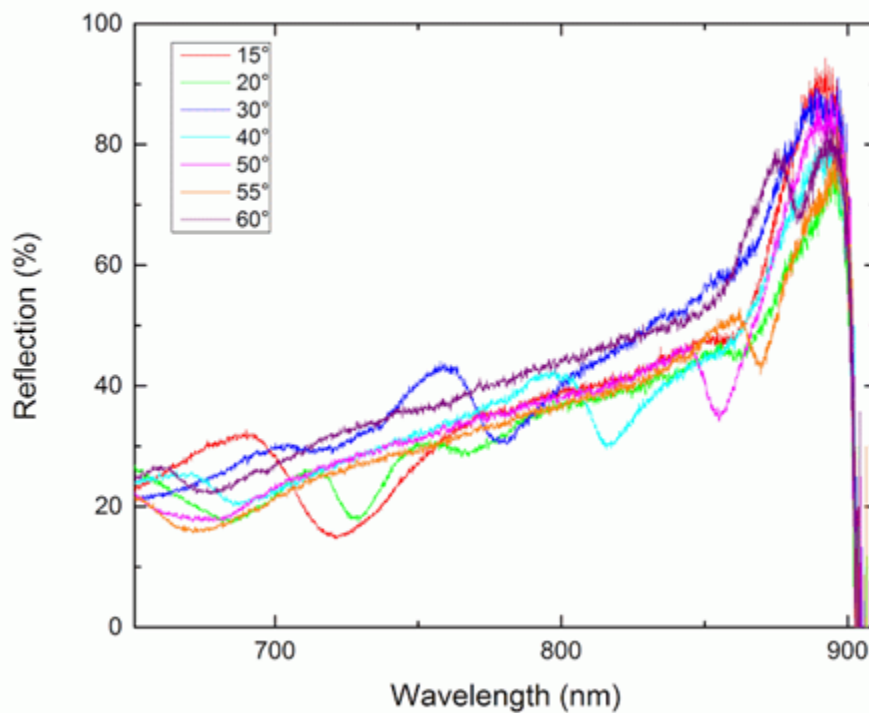
angle adjustment - 500nm front side in water



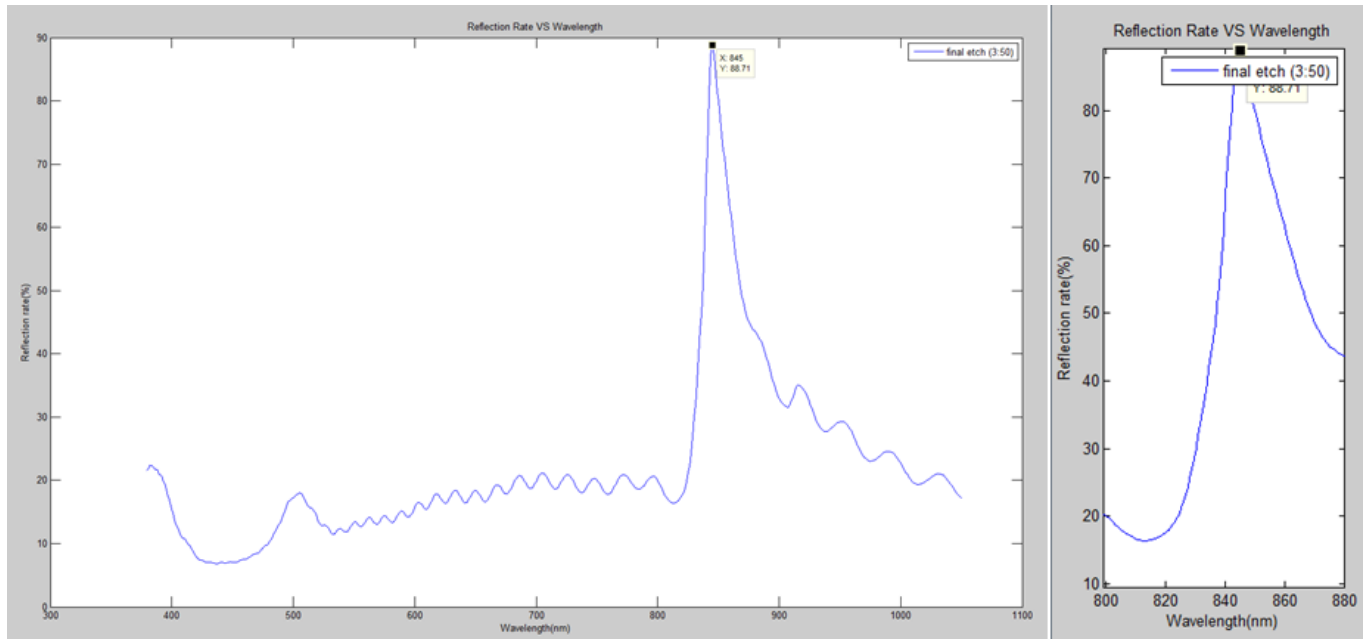
frontside in water - 600nm , no significant deep for backside



After angle adjustment, it seems the deep (resonance)move out of detecting range of transducer



2. We etch the sample photonic crystal sensor to characterize that the best performance wavelength is surely at 845nm. The sensor is good enough for our usage for detection.



Pending issues

1. We need to use the microphone combine with the oscilloscope to get the waveform for the 40 kHz acoustic wave transducer. Then use it as the reference for our detection results.
2. We need the devices that can detect 1000 nm wavelength for generation part.
3. Incident angle can be predicted if third measurement based on sensor (500/210 nm) can be made.

Plans for next week

1. We will measure the waveform for the 40 kHz acoustic wave transducer and use it as the reference.
2. Starting to test the detector to get the detection results.

Individual Contributions (this two week)

- Wenbing Ma attended the meeting(1hr), etch the photonic crystal sensor in MRC (5hr), first try for the detector using the etched sensor to get the waveform for acoustic wave (6hr).
- Jingxiang Zhang attended the meeting(1hr),test the sensor in MRC and test the result with different conditions.(6hr) Get the different waveform and compare with the waveform we get at matlab, and try to verify different part.(6hr)

- Xuan Zhang attended the meeting.(1hr) , etch the photonic crystal sensor in MRC (5hr), first try for the detector using the etched sensor to get the waveform for acoustic wave (6hr)
- Chenyin Liu attended the meeting.(1hr), Jingxiang Zhang attended the meeting(1hr),test the sensor in MRC and test the result with different conditions.(6hr) Get the different waveform and compare with the waveform we get at matlab, and try to verify different part.(6hr)
- Zhikai Cui attended the meeting.(1hr), etch the photonic crystal sensor in MRC (5hr), first try for the detector using the etched sensor to get the waveform for acoustic wave (6hr)

Total contributions for the project

Wenbing Ma (12 hr)

Jingxiang Zhang (12hr)

Xuan Zhang (12hr)

Zhikai Cui (12hr)

Chenyin Liu (12hr)