COLLEGE OF ENGINEERING
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# Research Horizons Day
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# Super-period gold nanodisk grating for surface plasmon resonance spectrometer biosensor

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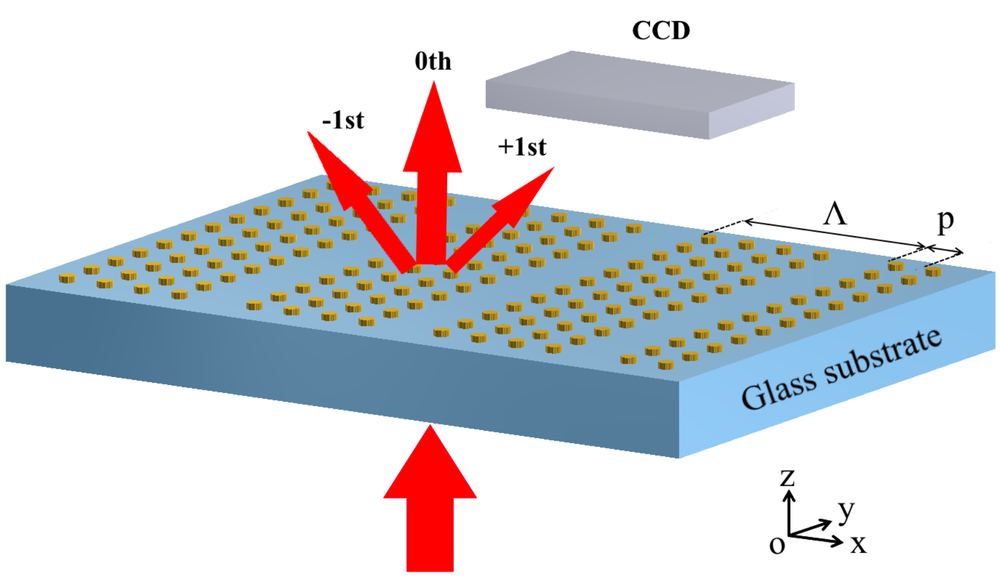
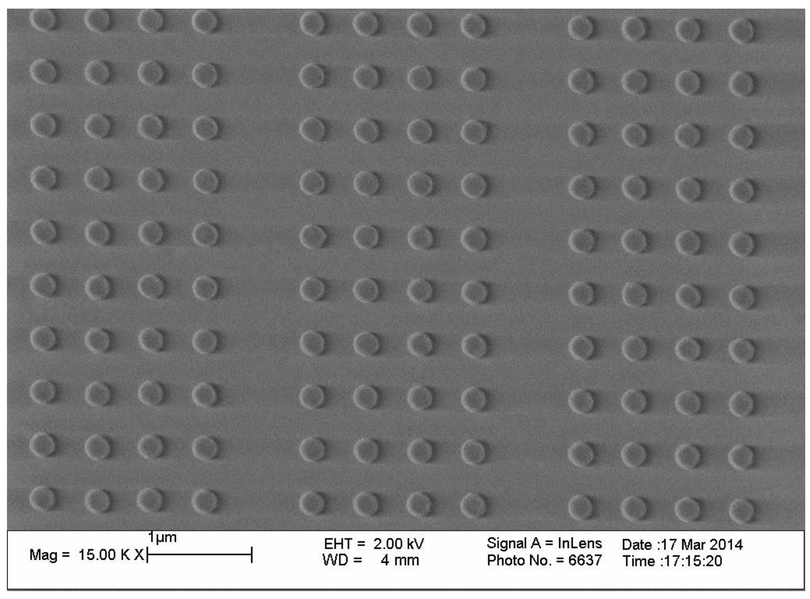
## Abstract

**We demonstrate a surface plasmon resonance spectrometer biosensor by using an e-beam patterned 2D gold nanodisk grating. The gold nanodisk grating has a subwavelength nanodisk period and a super-wavelength nanodisk period. Due to coherent scattering from these patterned gold nanodisks, surface plasmon resonance can be measured from the first order diffraction with a linear photodetector array, such as a CCD. A surface plasmon resonance sensor for the bonding of nanometer scale bovine serum albumin (BSA) protein layer is demonstrated by measuring the surface plasmon resonance shift in the first order diffraction spatial.**

## Surface Plasmon Resonance Spectrometer

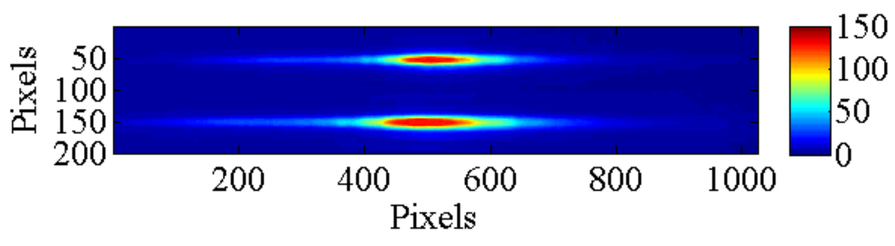


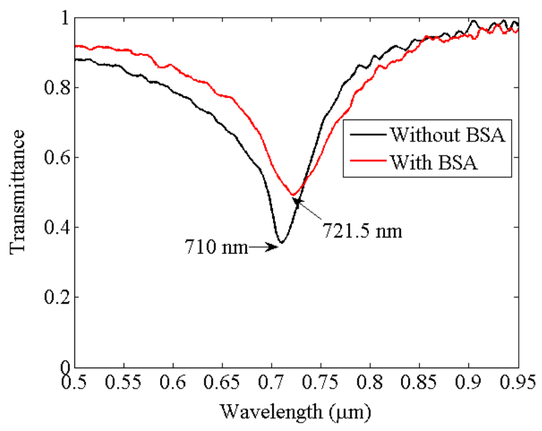

Schematic of the gold nanodisk grating

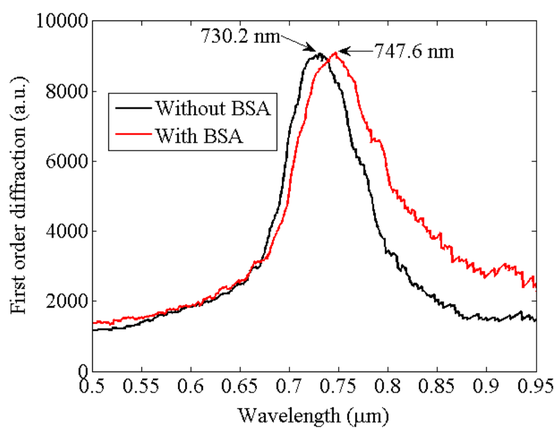



SEM picture of the fabricated device

## Experimental Results




## Conclusion

- A new surface plasmon resonance spectrometer biosensor using a gold nanodisk grating is demonstrated. With this gold nanodisk grating, the SPR spectrum can be measured by using a CCD instead of using a spectrometer.
- The demonstrated surface plasmon resonance measurement technique is similar to dark field microscope spectroscopy, which measures the spectrum of off-axis scattering light by avoiding the strong transmission light.

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