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Exploring the Detection Limit of Nanohole Array Sensors[1]
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Light incident on an opaque metallic film perforated by a periodic array of nanoholes demonstrates "extraordinary optical transmission" (EOT), where certain frequencies of light pass through the sub-wavelength sized holes. This behavior has been attributed to resonance interactions between incident photons and surface plasmon polaritons [1]. Arrays of various periodicities have been milled in 100nm gold films on glass substrates using focused ion beam. Surface plasmon resonance peaks have been recorded using a spectrometer. Peak shape and position is a function of the array geometry and dielectric environment. EOT's sensitivity to the dielectric environment suggests it may be used to detect chemical/biological events occurring at an array surface [2, 3]. We seek to understand how small of an event may be measured with such arrays. With this knowledge, we will attempt to fabricate a quick and efficient sensor for antibody detection and characterization. References
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