Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Developing a nanoscale pressure sensor utilizing the Plasmon Ruler ALEX TAYLOR, DAVID CARROLL, Wake Forest Univ — We demonstrate a novel method for detecting pressure by utilizing the Plasmon Ruler; the effect by which the frequency of light scattered by a nanoparticle (NP) is red shifted when brought into close proximity with another NP. This distance dependent phenomenon is leveraged by a film/NP architecture, wherein silver NPs are suspended above a silver film by a polymer spacing layer. As the fluid pressure above the rigid substrate is increased, the polymer layer is compressed and the NP height is decreased, leading to a measurable redshift in the plasmon resonance frequency. Thus, by factoring in the strength of the polymer film's restoring force we can determine the pressure being applied. These devices were constructed onto fiber optic wires, which allow us to probe the device using the evanescent field from light inside the glass core. This naturally leads to *in vivo* medical applications, such as inter-compartment or inter-cranial pressure sensing via the inserted fiber optic probe.

Alex Taylor
Wake Forest Univ

Date submitted: 14 Nov 2014 Electronic form version 1.4