Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Plasmon Resonance Energy of Nickel Manganese Films JAMIE SMITH, KEN PODOLAK, SUNY Plattsburgh — Plasmonics studies how light interacts with conductors at the nanoscale level. Plasmons result from a collective oscillation of charges. Surface plasmonics has become of interest due to the ability to confine optical energy into subwavelength volumes, however the ability to control and manipulate them has yet to be developed. In the future, plasmonics can revolutionize optical devices with increased performance speed and functionality. To alter the properties of a surface plasmon wave, an active layer is grown beneath a metal surface. Since, part of the plasmon's electromagnetic field resides in this layer, the layer couples to the surface plasmons. Thus, each sample studied was composed of an amorphous nickel manganese film grown on top of silicon with a capping copper layer. Optical absorption measurements were made with these films using a Cary-OLIS spectrophotometer from 190 – 450 nm. Two peaks in the absorption of each sample were found: one around 3.30 eV which is the surface plasmon peak as seen in previous literature and a bound electron peak at 4.45 eV. The full width half maximum of the surface plasmon peak is observed to increase when increasing the manganese concentration in each sample. A discussion as to possible reasons why will be presented.

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Date submitted: 26 Nov 2011 Electronic form version 1.4