Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Enhancement of the excition emission in ZnO nanowires[1] ANDREW EPPS[2], JAMIE NOWALK[3], MARIAN TZOLOV[4], Lock Haven University — The ZnO nanowires were grown by the chemical vapor transport method using a thin gold film as a catalyst. Their light emission in the visible and near UV spectral range was excited by continuous wave and pulsed UV light and by electrons within an SEM. The emission spectrum consists typically of the exciton emission band and a band in the green spectral range related to structural defects. We have followed the evolution of the ratio between the exciton and green band between our samples. The highly localized excitation by the electron beam allowed the profiling of the emission spectrum across the thickness of nanowire samples. We demonstrate that the tips of the nanowires show substantially higher exciton emission. Depth of excitation was varied independently by the electron accelerating voltage. The results have been interpreted within a model accounting for the surface effects and associated band banding at the surface.

[1]AE acknowledges the financial support from the NSF
[2]Undergraduate
[3]Undergraduate
[4]Professor

Andrew Epps
Lock Haven University Undergraduate

Date submitted: 08 Nov 2012 Electronic form version 1.4