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**Synthesis and Characterization of Ni-NiO Nanocomposites for Optoelectronic Applications** G. BEAVER, A. LAUDARI, K. GHOSH, Missouri State University — LEDs and solar cells are becoming increasingly ubiquitous in modern society as they offer low energy consumption in a world where energy concerns are becoming increasingly prominent. Nonetheless, these devices have to overcome several shortfalls before they will be able to effectively replace traditional devices. In particular, these devices are fabricated using diodes, which depend on p-n junctions. While n-type oxide semiconductors are relatively plentiful, p-types are harder to produce. This research attempts to create a p-type oxide semiconductor with long lifespan and low resistivity. Using pulse laser deposition, NiO thin films with Ni nanoparticles were fabricated on quartz and Al<sub>2</sub>O<sub>3</sub> substrates. Detailed structures of the thin films were studied by X-Ray diffraction, scanning electron microscopy, and Raman spectroscopy techniques. Physical parameters such as magnetic moment of nickel, carrier concentration, and bandgap have been estimated using ultra violet-visible spectroscopy, photoluminescence, Hall effect, and magnetization data. Detailed results will be discussed in the presentation. This work is supported by NSF (Award Number DMR-0907037).

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