

## **Optical and Structural Properties of Solution Deposited Nickel Manganite Thin Films**

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**Abstract:** Nickel manganite thin films of interest for microbolometer applications have been prepared using chemical solution and spin spray deposition and studied using transmission electron microscopy to quantify the material crystallinity and spectroscopic ellipsometry to extract the complex dielectric function ( $\epsilon = \epsilon(1) + i\epsilon(2)$ ) and film microstructure. A parameterization for  $\epsilon$  over a spectral range from 0.04 to 5.15 eV has been developed to model well-crystallized nickel manganite, and the visible-range critical point features, infrared vibrations, and optical absorption onset have been identified. A multiple sample analysis structural model and procedure has been developed for spin spray deposited films exhibiting complicated void evolutions with thickness. Variations in  $c$  and crystallite grain size have been observed as a function of film processing and indicate that the optical properties and microstructural information gained from spectroscopic ellipsometry is useful in process monitoring for this material system.

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