

## LOW AND HIGH-RESOLUTION LASER-INDUCED FLUORESCENCE (LIF) of JET-COOLED NdO

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The chemi-ionization reactions of atomic lanthanides  $M + O \rightarrow MO + e^-$  are currently being investigated as a method to artificially increase the ion density in the ionosphere for uniform radio wave propagation. Recent experiments involving the release of atomic neodymium (Nd) into the upper atmosphere have resulted in the production of a cloud with green emission[1]. Based on the cloud emission, it is believed that NdO was the primary product, but spectroscopic characterization of NdO is needed to properly identify the emitting species. While NdO is well characterized above 590 nm, little spectroscopic data exists at emission wavelengths below 590 nm[2,3]. In this work, jet-cooled NdO was produced and low- and high-resolution laser-induced fluorescence (LIF) and dispersed laser-induced fluorescence (DLIF) techniques were used to characterize the electronic structure of NdO from 15,500-21,000  $\text{cm}^{-1}$ . Congested DLIF spectra allowed vibrational characterization of the ground X4 state as well as five low-lying states for the first time. By employing high-resolution LIF, the hyperfine structure of the ground X4 state was obtained. Data and analysis of the ground and low-lying states of NdO will be presented.

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