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Infrared Lattice Dynamics of LaAlO₃ TRAVIS WILLETT-GIES, ERIC DELONG, STEFAN ZOLLNER, LINA ABDALLAH, NMSU, IGAL BRENER, Sandia National Laboratory — Lanthanum aluminate (LaAlO₃) is a member of the group of ceramics known as perovskites which have many potential applications in the semiconductor industry. Lattice vibration energies of LaAlO₃ were determined using infrared ellipsometry. Scans were taken from 200 to 5000 cm⁻¹ in air at 300 K. The data was used to calculate the complex dielectric function of LaAlO₃ from which the energies and intensities of the long wavelength infrared-active lattice vibrations could be determined. An intense phonon mode with $\omega=426.97\pm 0.07$ cm⁻¹ and $\Gamma=4.05\pm 0.11$ cm⁻¹ as well as a secondary absorption peak with $\omega=652.93\pm 0.06$ cm⁻¹ and $\Gamma=21.42\pm 0.18$ cm⁻¹ were found. These results agree with phonon energies found in previous reflectance experiments. This work was performed, in part, at the Center for Integrated Nanotechnologies, an Office of Science User Facility operated for the U.S. Department of Energy (DOE) Office of Science by Los Alamos National Laboratory (Contract DE-AC52-06NA25396) and Sandia National Laboratories (Contract DE-AC04-94AL85000).

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