

Abstract Submitted
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Terahertz Spectroscopy of Ni-Ti Alloy Thin Films¹ MICHAEL PAUL, ANDY JAMESON, JOE TOMAINO, JOSH KEVEK, Department of Physics, Oregon State University, MEGHAN HEMPHILL JOHNSTON, JUSTIN ONG, MILO KORETSKY, School of Chemical, Biological & Environmental Engineering, Oregon State University, ETHAN MINOT, YUN-SHIK LEE, Department of Physics, Oregon State University — We investigate the carrier dynamics in nickel-titanium (Ni-Ti) alloy thin films using THz transmission spectroscopy. Ni-Ti alloys have peculiar mechanical properties, in particular, shape memory effects. Electrical conductivity can be a good measure to characterize the phase transitions. We fabricated 60~80-nm Ni-Ti alloy films of various Ti concentrations (0-100%). The films were deposited on Si substrates by Ar plasma sputtering. Analyzing the relative power transmission and transmitted waveforms, we obtained the alloy film resistivity of several different Ti concentrations. DC resistivity measurements were made via 4-point probe for comparison. Results show sharp changes in resistivity near the Ti fractions of 22%, 44%, and 62% by weight. Previous studies of the Ni-Ti system have shown that the alloy undergoes a phase transition at each of these compositions.

¹NSF, ONAMI

Michael Paul
Department of Physics, Oregon State University

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