Abstract Submitted
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Experimental and Numerical Studies of Thermal Lensing in Optical Materials SAMANTHA FRANKLIN, USAF 711 HPW/RHDO — A common issue found in near-IR laser applications with multi kW beams is thermo-optical effects due to small levels of absorption of the optical material used in the beam train elements. To validate current beam propagation codes for this application, a closed-aperture Z-scan experiment was performed. Commercially available NG11 and NG4 (Schott glass) absorptive neutral density filters were used as the sample with optical densities ranging from 0.1-0.5. They were exposed with a 532 nm beam at 100mW power for 1 s at different z-positions in the optical path. The experimental parameters were entered into the computer model and the irradiance vs. position (in meters) of the computer model output data was compared to the graph of normalized irradiance vs. z-position (in meters) of the Z-scan experiment. Experimentally measured values were compared to calculations from the laser propagation model; the results of this comparison showed that the modeling program is a proper measuring tool in the outcome of a thermal lensing experiment. Public Release Code: AFRL-RH-AB-2010-0043 PA# 10-350

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