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Novel characterization of the nonlinear refractive response of materials using spatially and spectrally resolved interferometry AMANDA MEIER, DANIEL ADAMS[1], JEFF SQUIER, CHARLES DURFEE, Colorado School of Mines — Characterization of the nonlinear refractive index of a material is important in order to fully understand the nonlinear propagation of femtosecond laser pulses. The most common method to obtaining the nonlinear refractive index is Z-scan. However, since it averages over pulse duration and beam profile, Z-scan is not reliable when there is time- and intensity-dependence of the nonlinear response. The new method we are exploring to make these nonlinear refractive index measurements is spatially and spectrally resolved interferometry (SSRI). SSRI is a method that can give a simultaneous measurement of the spatial wave-front across the frequency or temporal profile of the pulse. The SSRI method proves better in measuring response at specific y and t, allowing it to measure both delayed response and saturation effects. The ability to make a measurement in both dimensions enables understanding of spatiotemporal dynamics in other experiments as cross-wave polarization and filamentation.

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