

Abstract Submitted
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Analysis of Picosecond Pulses by Optical Heterodyning STEVEN HOKE, JEFFREY JOHNSON, Arkansas State University — In earlier work [Hoke, Johnson. <http://meetings.aps.org/link/BAPS.2012.DAMOP.Q1.148>] we extended optical heterodyning (OH) methods into the picosecond realm. A reference beam in OH must have a much narrower linewidth than the pulse to be analyzed; a requirement readily achieved, with respect to picosecond pulses, by nanosecond pulses from a seeded single-longitudinal-mode nanosecond laser. Fourier analysis methods have been refined and yield consistent measurements of the frequency variation within each picosecond pulse. The method is used to examine the output of a second harmonic generator (with and without third harmonic generation) in our picosecond laser system, as well as an optical parametric oscillator (OPO.) Our source pulses display a positive linear chirp near their centers. The third harmonic generator accentuates the chirp already present in these pulses, while the OPO reshapes the chirp more significantly, often reversing the direction of chirp. The resolution limit of this technique on our streak camera is explored. (Approved for Release.)

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