

Abstract Submitted  
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**Up-Conversion Methods for Multi-dimensional Infrared Spectroscopy** KENT MEYER, Chemical Sciences Division, Oak Ridge National Laboratories — Heterodyned detection methods for recently developed non-linear multi-dimensional infrared ultrafast spectroscopic techniques can provide substantial sensitivity over homodyne methods, but restrictions on phase stability currently only allow this technique to be used with single infrared laser sources and modest pulse widths. For a dual infrared experiment, a frequency-scanned homodyne method was instead performed where this phase restriction is removed. An up-conversion method for the homodyne infrared source using three and four-wave mixing crystals was considered, where surprisingly it was found that sensitivities even higher than the heterodyne method may be achievable. Experimental up-conversion spectra on a model tricarbonylnickel compound show the feasibility of this method and also show a change in cross-peak intensities that is uninterpretable with computer fitting algorithms.

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