STRETCHING INFRARED SPECTROSCOPY; 2D-IR ANALOGUES OF NMR YIELD SOLUTION PHASE STRUCTURAL CONSTRAINTS AND DYNAMICS

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I will survey the recent advances in the methods and applications of multidimensional IR spectroscopy which promise structurally based kinetic probes for conformational dynamics, parameters of anharmonic potential surfaces and novel information on vibrational frequency correlation functions.[a] The nonlinear response, which is sensitive to intermode couplings and angular relations amongst transition dipoles, can be created by sequences of phase controlled femtosecond IR pulses having the same or different polarization and/or center frequencies. The methods involve echo-like responses in multiple level systems where correlations are important. The applications are to peptides, helical structures and their isotopomers.

[a] Asplund, M. C., M. T. Zanni, et al. "Two-dimensional infrared spectroscopy of peptides by phase- controlled femtosecond vibrational photon echoes." Proc. Natl. Acad. Sci. U. S. A. 2000,97(15): 8219-8224.