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Characterization of transient molecular vibrations on the way towards coherently controlled vibrational target state STANISLAV KONOROV, XIAOJI XU, JOHN HEPBURN, VALERY MILNER, Cmenistry Department, Univercity of British Columbia — We study molecular vibrational dynamics under the excitation by spectrally shaped broadband laser pulses. After performing a single measurement based on cross-correlation frequency resolved optical gating of molecular vibration, complete evolution of the complex-valued quantum coherence between the vibrational states is reconstructed with variable time and frequency resolution. The ability to change the resolution in the analysis of the transient molecular dynamics without repeating the experiment or changing experimental parameters is useful in designing and understanding various schemes of controlling quantum states of molecules.

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