

Abstract Submitted
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Femtosecond CARS on organic molecules¹ DMITRY PESTOV, MIAOCHAN ZHI, ROBERT MURAWSKI, ALEXEI SOKOLOV, NIKOLAI KALUGIN, YURI ROSTOVTSEV, ZOE SARIYANNI, VLADIMIR SAUTENKOV, MARELAN SCULLY, Department of Physics and Institute for Quantum Studies, Texas A&M University — Quantum coherence dynamics on vibrational transitions in organic molecules is studied by means of femtosecond Coherent Anti-Stokes Raman Scattering (CARS) technique. CARS signal profiles for high-frequency Raman transitions in methanol and ethanol, as representative simple organic substances, are obtained. The detailed, good-visibility profiles, spanning six decades in signal magnitude, show clear low-frequency oscillations, attributed to quantum beats, and make it possible to extract decoherence time constants. Non-trivial dependence of these constants on methanol/ethanol concentration in water solution is observed. Coherent response from a saturated solution of dipicolinic acid, which has much more complex molecular structure, is also demonstrated.

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