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Femtosecond Chirped Pulse Adiabatic Control of Condensed Phase Multiphoton Processes

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Multiphoton processes are often difficult to control—more so in the condensed phase. Model calculations and feedback-loop coherent control experiments [1,2] have often failed to come up with simple chirped pulse predictable control results, though it has been conjectured in model simulations [3] that under the adiabatic limit, it should be possible to mimic most of the single-photon coherent control experiments.

In the present paper we present the first evidence of adiabatic multiphoton control experiments in condensed phase wherein the single-photon coherent control principles and predictions prevail. We quantify our experimental results in terms of the efficiency of the two-photon absorption and emission processes as a function of chirp of the femtosecond laser pulses.

We demonstrate that our results are completely independent of the nature of molecular system and are dictated only by the laser pulse chirp property. Efforts are also in progress to extend this result beyond the two-photon processes.

References:
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