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Maximum coherence control technique in a super-effective two-level CARS system[1] NEIL PANDYA, GENGYUAN LUI, SVETLANA MALINOVSKAYA, Stevens Institute of Technology — Advances in ultrafast laser technology have brought new opportunities and challenges to investigations of light-matter interaction as well as applications at the frontier of science and technology. Owing to the accuracy and instantaneity, the technique of Coherent anti-Stokes Raman Spectroscopy (CARS) is widely studied and used in the area of remote detection. Preparing the maximum coherence between vibrational states in target molecules is the essential condition of generating CARS signal. In this work, we present a new adiabatic control method to achieve the maximum coherence between target vibrational states. We reduced the four-level CARS system to a super-effective two-level system based on the adiabatic condition produced by several key parameters. The study shows that the control conditions which result in optimal coherence include but are not limited to a roof chirped probe pulse.

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