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Decoherence analysis in a super-effective two level CARS scheme[1]

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— The use of Coherent anti-Stokes Raman Spectroscopy (CARS) for remote detection is practical under the condition that the coherence between vibrational states in the target molecules is maximized. To this end, a new adiabatic control method consisting of reducing the four level CARS scheme into a super-effective two level scheme was developed in previous works [1]. In this work, we have applied the theory of decoherence to the Liouville-von Neumann equation for the time evolution of the density matrix. The theory was developed on the basis of collisional decay in two coupled lambda systems. The analysis and numerical results guided further models on how the fields will propagate through the target molecules.

References: Neil Pandya, Gengyuan Lui, Elliot Pachniak, Jabir Chathanathil, Svetlana Malinovskaya, Maximum coherence control technique in a super-effective two-level CARS system (paper in progress).

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