

THEORETICAL ANALYSIS OF THE RESONANCE FOUR-WAVE MIXING AMPLITUDES: A FULLY NON-DEGENERATE CASE.

ALEXANDER KOUZOV, *Department of Physics, Saint-Petersburg State University, St. Petersburg, Russia.*

Degenerate (one-color) and two-color variants of the resonant four-wave mixing (RFWM) have developed into a sensitive and nonintrusive spectroscopic tool to study molecules in different gaseous environments. Yet, the fully non-degenerate (four-color, 4C) RFWM was scrutinized and implemented only for the Coherent AntiStokes Raman Scattering (CARS) excitation scheme^{a, b}. Here, by using the line-space approach^c, we analyze other 4C-RFWM schemes potentially interesting for the efficient up- and down-frequency conversion as well as for studies of molecular states. Decoupled expressions of the 4C-RFWM amplitudes are derived which allows to predict their polarization dependence.

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