

<<多波混频>>

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前言

Nonlinear optics covers very broad research directions and has been a very active area of research for about fifty years since the invention of the first laser at the beginning of 1960s. There are several excellent text books devoted to various aspects of nonlinear optics including Nonlinear Optics by R.W.Boyd , Nonlinear Optics by Y.R.Shen , Quantum Electronics by A.Yariv , Principles of Nonlinear Optical Spectroscopy by S.Milkanel , and Nonlinear Fiber Optics by G.P.Agrawal. Multi-wave mixings in gases , liquids , and solid materials are important parts of the nonlinear optical process. Typically, lower-order nonlinear optical processes always dominate since they are more efficient than higher-order ones.

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内容概要

Multi-Wave Mixing Processes From Ultrafast Polarization Beats to Electromagnetically Induced Transparency discusses the interactions of efficient multi-wave mixing (MWM) processes enhanced by atomic coherence in multilevel atomic systems. It covers topics in five major areas: attosecond and femtosecond polarization beats of four-wave mixing (FWM) processes; heterodyne detection of FWM, six-wave mixing (SWM) and eight-wave mixing (EWM) processes; Raman and Rayleigh enhanced polarization beats; coexistence and interactions of MWM processes via electromagnetically induced transparency (EIT); multi-dressing MWM processes. The book is intended for researchers, advanced undergraduate and graduate students in Nonlinear Optics.

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<<多波混频>>

书籍目录

1 Introduction 1.1 Nonlinear Susceptibility 1.2 Four-wave Mixing 1.3 Generalized Resonant MWM in Multi-level Atomic Systems 1.4 Enhanced Nonlinearity via Electromagnetically Induced Transparency
References2 Femtosecond Polarization Beats 2.1 Effects of Field-correlation on Polarization Beats 2.1.1 PBFS in a Doppler-broadened System 2.1.2 Photon-echo 2.1.3 Experiment and Result 2.2 Correlation Effects of Chaotic and Phase-diffusion Fields 2.2.1 Photon-echo 2.2.2 Experiment and Result 2.3 Higher-order Correlations of Markovian Stochastic Fields on Polarization Beats 2.3.1 HOCPB in a Doppler-broadened System 2.3.2 Photon-echo 2.3.3 Experiment and Result References3 Attosecond Polarization Beats 3.1 Polarization Beats in Markovian Stochastic Fields 3.2 Perturbation Theory 3.3 Second-order Stochastic Correlation of SFPB 3.4 Fourth-order Stochastic Correlation of SFPB 3.5 Discussion and Conclusion References4 Heterodyne/Homodyne Detection of MWM 4.1 Modified Two-photon Absorption and Dispersion of Ultrafast Third-order Polarization Beats 4.1.1 Liouville Pathways 4.1.2 Color-locking Stochastic Correlations 4.1.3 Purely Homogeneously-broadened Medium 4.1.4 Extremely Doppler-broadened Limit 4.1.5 Discussion and Conclusion 4.2 Color-locking Phase Control of Fifth-order Nonlinear Response 4.3 Seventh-order Nonlinear Response References5 Raman- and Rayleigh-enhanced Polarization Beats 5.1 Raman-enhanced Polarization Beats 5.1.1 Chaotic Field 5.1.2 Raman Echo 5.1.3 Phase-diffusion Field 5.1.4 Gaussian-amplitude Field 5.1.5 Experiment and Result 5.2 Rayleigh-enhanced Attosecond Sum-frequency Polarization Beats 5.2.1 Stochastic Correlation Effects of RFWM 5.2.2 Homodyne Detection of Sum-frequency RASPB 5.2.3 Heterodyne Detection of the Sum-frequency RASPB 5.2.4 Discussion and Conclusion References6 Coexistence of MWM Processes via EIT Windows 6.1 Opening FWM and SWM Channels 6.2 Enhancement of SWM by Atomic Coherence 6.3 Observation of Interference between FWM and SWM 6.4 Controlling FWM and SWM Processes References7 Interactions of MWM Processes 7.1 Competition between Two FWM Channels 7.2 Efficient Energy Transfer between FWM and SWM Processes 7.3 Spatial and Temporal Interferences between Coexisting FWM and SWM Signals References8 Multi-dressed MWM Processes 8.1 Matched Ultraslow Pulse Propagations in Highly-Efficient FWM 8.1.1 Time-dependent, Adiabatic Treatment for Matched Probe and NDFWM Signal Pulses 8.1.2 Steady-state Analysis 8.1.3 Discussion and Outlook 8.2 Generalized Dressed and Doubly-dressed MWM Processes 8.2.1 Generalized Dressed-(2n 2)WM and Doubly-dressed-(2n 4)WM Processes 8.2.2 Interplays Among Coexisting FWM, SWM, and EWM Processes 8.3 Interacting MWM Processes in a Five-level System with Doubly-dressing Fields 8.3.1 Three Doubly-Dressing Schemes 8.3.2 Autler-Townes Splitting, Suppression, and Enhancement 8.3.3 Competition between Two Coexisting Dressed MWM 8.3.4 Conclusion and Outlook ReferencesIndex

<<多波混频>>

章节摘录

插图：Interaction between the two dressing fields in the nested-cascade scheme is the strongest and that of the parallel-cascade scheme is the weakest. This conclusion is verified further in the simulated spectra. First in the AT splitting spectrum. The dressing fields of the nested cascade scheme are entangled tightly with each other and have strong interaction. In Fig.8.15 only the inner dressing field E3 can create the primary AT splitting, based on which the outer dressing field E4 can create the secondary AT splitting. On the other hand, for the parallel-cascade scheme, the dressing fields have a weaker interaction and they can directly create two independent AT splittings (see Fig.8.17). However, for the sequential-cascade scheme the dressing fields can also directly create AT splitting but they have a strong interaction to create the primary and secondary AT splittings, as shown in Fig.8.18).

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