

Cooperative Effects In Optics Superradiance And Phase

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Quantum effects in the cooperative scattering of light by ...

optics regime of such systems has been extensively studied, and many-body effects such as superradiance [5,6], modification of the radiation pressure force [7,8], and cooperative frequency shifts [9-13] have been reported The effective coupling between the atoms in the cloud, mediated by the

Coherent and collective quantum optical effects in ...

A review of coherent and collective quantum optical effects like superradiance and coherent population trapping in mesoscopic systems is presented Various new physical realizations of these phenomena are discussed, with a focus on their role for electronic transport and quantum dissipation in coupled nano-scale systems like quantum dots

Cooperative Effects in the Optical Response of Dense ...

Cooperative Effects in the Optical Response of Dense Atomic Gases Yi Li, PhD University of Connecticut, 2016 ABSTRACT At high density, dipole-dipole interactions between the atoms may have a major impact on light propagation in a dense gas We have developed a classical-electrodynamics simulation to study the cooperative response of a near

1D A arXiv:1503.04503v1 [physics.optics] 16 Mar 2015

PCW Superradiance has important applications for realizing quantum memories [18-22], single photon sources [23, 24], laser cooling by way of cooperative emission [25, 26], and narrow linewidth lasers [27] Related cooperative effects are predicted in nano-photonic waveguides absent an

exter-

Superradiance of a subwavelength array of classical ...

(2404350) Nonlinear optics at surfaces References and links 1 L Brandes, "Coherent and collective quantum optical effects in mesoscopic systems," Phys Rep 408 Superradiance (SR) is a cooperative spontaneous radiation of photons by an array of emitters

Cooperative Coherent Phenomena in Annihilating Electron ...

plasma) Such a macroscopic approach directly takes into account the cooperative behaviour of particles and the coherent effects in their interaction with a self-consistent radiation field [5,51] The use of this method implies the semiclassical description of the matter-field interaction [52,53]

Direct single-shot observation of millimeter-wave ...

We trigger the cooperative effects with a weak initial pulse and detect the time-dependent amplitude and phase of the emitted radiation interest in quantum optics since the original description of the phenomenon by Dicke [1] Any description of superradiance more complete fundamental description of superradiance and cooperative effects

Cooperative behavior of quantum dipole emitters coupled to ...

Cooperative behavior of quantum dipole emitters coupled to a zero-index nanoscale waveguide entanglement generation and extend the spatial scale at which the superradiance can be observed KEYWORDS: entanglement, superradiance, effective zero index, quantum optics, plasmonics may enable observation of quantum cooperative effects without

Multiple-scattering approach to interatomic interactions ...

Multiple-scattering approach to interatomic interactions and superradiance in inhomogeneous dielectrics Martijn Wubs,^{1,2,*} L G Suttorp,³ and A Legendijk¹ ¹Complex Photonic Systems, Faculty of Science and Technology, University of Twente, PO Box 217, NL-7500AE Enschede, The Netherlands

Light interacting with atomic ensembles: collective ...

Collective effects in the fluorescence, which can be explained by Beer-Lambert law or by multiple scattering (a) Total fluorescence as a function of the detuning for different atom numbers ($N = 1, 5, 20, 50, 500, 325, 450$ from the bottom to the top) and a Gaussian cloud of rms transverse size $R = 0.6\lambda$ (71) Broadening and saturation effects are

Dicke superradiance in solids [Invited]

phenomenon called the Dicke superradiance (SR) [14], by which Dicke introduced the profound concept of cooperative and coherent spontaneous emission This general concept, as detailed below, has been studied in different areas of contemporary science and engineering, especially quantum optics, condensed matter physics, optoelectronics, and

Program: FP7-ICT-FET-OPEN Blue Femtosecond Laser ...

[Andreev-93]-4 Cooperative Effects in Optics: Superradiance and Phase Transitions Andreev A V, Yemel'yanov V I and Il'inskii Yu A (Bristol: Institute of Physics Publishing, 1993) 1993 [Bastard-91] Wave mechanics applied to heterostructures G Bastard (Wiley-Interscience, 1991) 1991

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Recent breakthroughs in the areas of swept-gain superradiance, laser induced chemistry, and optical bistability have led to a broad program which encompasses and is germanely relevant to the major areas of specialization in coherent cooperative effects being ...

collective effects of nuclei in single x-ray photon ...

of superradiance in both bulk nuclear samples and in thin-film cavities with an embedded ^{57}Fe nuclear layer We develop for the first time a general theoretical framework to investigate a single-photon cooperative emission from a cloud of resonant systems, atoms or nuclei, in the presence of magnetic (hyperfine) splitting

arXiv:1503.04503v1 [physics.optics] 16 Mar 2015

Superradiance has important applications for realizing narrow linewidth lasers [27] Related cooperative effects [physics.optics] 16 Mar 2015 2
transverse-electric (TE) polarized in the

Working Group 4: Cooperative effects, correlations & many ...

- To analyze collective phenomena (superradiance, self-organization, photon condensation, etc) in the quantum regime
- To develop new experimental platforms (optical, plasmonic, optomechanical) for collective light-matter interactions at the nanoscale
- To investigate photonic quantum simulation schemes with nano-photonics devices

arXiv:1702.01053v1 [physics.atom-ph] 3 Feb 2017

many collective (or cooperative) effects, such as multiple scattering, superradiance and subradiance, even if the atomic density is low and the incident optical intensity weak (linear optics regime) Tracing over the degrees of freedom of the light field, the system can be well described by an

Monday Morning, January 5 2009 - Texas A&M University

Superradiance Eric Akkermans, Chair Advances in Coherent Soft X-ray Sources Jorge J Rocca, Chair Ghost Imaging Jon P Davis, Chair 20:50 Aurel Bulgac, University of Washington, "The incredible many facets of a unitary Fermi gas" Eugene M Chudnovsky, CUNY Lehman College and Graduate Center, "Cooperative Effects and Possibility of