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Cooperative radiation between blocks of three radiators through single- and two-photon mutual interactions

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The three particle cooperative emission consisted from two dipole-active and one dipole-forbidden sub-system of radiators is proposed in the process of interaction through the vacuum or thermal field. It is demonstrate that in such three radiator interaction the collective decay rate becomes proportional to the product of the numbers of radiators in each subsystem: N_1 N_2 N_3. The proposed quantum kinetics takes into consideration single and two photon cooperative exchanges between dipole active and dipole forbidden subsystems of radiators (nuclei, atoms, molecules). The three particle cooperative interaction through the thermal bath and vacuum field takes place during the mutual influences of the single- and two-photon popularization between the pairs of dipole active atoms with the popularization of the dipole forbidden radiator of another ensemble. To describe this effect it is introduced the new correlation functions between the popularization of three radiators belonging to inverted systems of dipole active and dipole forbidden subsystems. The main difference between the Dicke super-fluorescence and new collective effect consists in the establishment of cooperative effect between one dipole-forbidden radiator in two-quantum exchanges with two dipole active radiators. After that the theory is extended to the ensemble of N such three-particle blokes. The cooperative decay rate becomes proportional to the cube of such radiators, N^3.

Biography

Nicolae A Enaki was born on 27 May in 1928 in Radenii Vechi, Ungheni, Republic of Moldova. In 1985 he was the Candidate in Physical and Mathematical Sciences (PhD). In 1993 Dr. in Physical and Mathematical Sciences (Dr. habilitatus), Academy of Sciences, Institute of Applied Physics: *One- and two-photon cooperative phenomena in Optics*. From 2002 he was the Professor of Physics of Moldova State University, Chisinau. In 2006 he became Head of Quantum Optics and Kinetic Processes Laboratory, Institute of Applied Physics, Academy of Sciences of Moldavia.

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