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Multipole cluster superradiance in gamma optics

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Abstract

The special features of superradiance in systems comprising a few closely grouped particles (clusters) are studied analytically in the case in which the exchange interaction starts to play a significant role. It is shown that the exchange interaction leads to super-Poissonian statistics of the emitted photons. Possible variants of the cluster structure, primarily in the nuclear systems, are considered, and the potential for obtaining multipole gamma superradiance is discussed.