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Quantum interference of Mössbauer gamma transitions in magnetic materials

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Abstract

In recent years there was the steady increase of actuality of the studies of quantum interference on gamma spectroscopic transitions induced by coherent perturbations. A special attention is paid to gamma transitions in compound (electron - nuclear) systems. In this work it is shown that quantum interference effects (QIE) occur in gamma quantum spontaneous emission spectrum of an electron - nuclear paramagnetic system when electron spin resonance is induced. The occurrence of QIE is connected to preparation of the quantum system initial state. The role of electron relaxation is defined: increase of relaxation rate (as it approaches the Rabi frequency of rf field) leads to extinguishing of QIE. The case of stationary excitation of Mössbauer sublevels by incoherent sources is considered.
