Manifestation of Quantum Interference in Lasing Without Inversion*

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In terms of quantum interference we demonstrate the physical mechanisms which lead to light amplification without population inversion. The similarities and differences between the two model schemes, namely, Λ and V-type, are emphasized. A coherent radiation field, on one hand, which drives one of the lasing levels, yields the quantum mechanical two paths via Autler-Townes splittings. On the other hand, the spontaneous emission in this driving transition plays a key role in the asymmetries between the absorption and the stimulated emission in the lasing transition.

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