

Electromagnetic field in a rectangular cavity: an example of second quantization

Abstract.

We consider the case of electromagnetic field inside a rectangular cavity with conducting walls as a form of a system described by classical mechanics equations. We pass these equations through the Lagrangian formalism to obtain the Hamiltonian formulation. Finally we apply canonical quantization to end up with a quantum theory of the electromagnetic field. Since classical electrodynamics can be interpreted as the quantum theory of a one photon system, then the above quantization is taken as the “quantization of the quantum theory of the electromagnetic field” or simply second quantization.

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