

**Georgios Minas  
(Athens)**

**The functional integral method in open quantum electrodynamics**

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This thesis describes how we can use functional integrals in order to calculate the well known results of open quantum electrodynamics.

The work consists of four parts: In the first part we describe the general properties of open quantum systems and the phenomenon of decoherence. In the second part we give a way to calculate the influence functional by using the technic which is called "close complex time formalism". In the third part we extend the above calculations in the case of systems with an infinite number of degrees of freedom (fields) and specifically in the electromagnetic field. In the fourth part we give a physical interpretation of the above results, based on the experimental data and we calculate the decoherence functional.