



ID de la contribución : 56

Tipo : Talk

Particle Production in Non-Dynamical Electromagnetic Backgrounds within a Functional LSZ Framework

Particle production from the vacuum is one of the most remarkable consequences of quantum field theory in the presence of non-dynamical backgrounds, with the Schwinger effect providing a paradigmatic example. In this work, we study particle-production processes in quantum field theories coupled to non-dynamical backgrounds within a functional formalism.

The external field is incorporated non-perturbatively into the free theory, modifying the corresponding free operator and its propagator. As a consequence, the natural basis is no longer given by plane waves, but by eigenfunctions of the background-dependent free operator. Interactions can then be introduced to study scattering and particle-production processes, which requires a suitable modification of the LSZ reduction formula.

We focus on a complex scalar field in the presence of a constant electric source, for which the modes can be expressed in terms of Weber functions. Within this framework, we investigate the production of two particle-antiparticle pairs from the vacuum, together with the related crossed processes, providing a setting in which to study how external backgrounds modify interaction amplitudes and particle production.

Primary author(s) : MERA BLANCO, Carmen (Universidad Complutense de Madrid (UCM)); Dr. RUIZ CEMBRANOS, José Alberto (Facultad de Ciencias Físicas, UCM); SANZ-CILLERO, Juan José (Universidad Complutense de Madrid and IPARCOS)

Presenter(s) : MERA BLANCO, Carmen (Universidad Complutense de Madrid (UCM))

Clasificación de la sesión : FÍSICA TEÓRICA

Clasificación de temáticas : Física Teórica