Ivan Dadic: Kaon Decay, Regeneration and Cascade Decay of KS, and Violation of CP-Symmetry within a Finite time Path QFT

We demonstrate that the finite-time-path field theory (FTPFT), is adequate tool for the calculation of kaon oscillation and decay. We apply a theory with mass-mixing Lagrangian by using the Gell-Mann - Pais like mixing matrix. The Dyson-Schwinger equations contribute to a pair K0 and ¯K 0 an another pair of CP symmetric KS ↔ KL kaons with different masses. This leads to K0 and ¯K 0 oscillations. To the mixing matrix we add self-energies connected to 2π and 3π decays of KS and KL kaons,respectively. We calculate single particle distribution of π0, π+, and π− emerging from KS and KL decay to 2π.The pions decay further as π0−>2γ, or π+(−)−− > μ, ν. These pion decays reflects in the time dependence of pion distribution. For π± the result is consistent with Gell-Mann - Pais formula. There is a novel feature, the correlation term indicating that the kaon decay and subsequent pion decay are not statistically independent. Unfortunately the effect is very hard to detect experimentally. We don't need artificial tools like non-hermiticity of the Hamiltonian hypotesis, neither the on-shell hypotesis.