



Contribution ID: 98

Type: not specified

Computing the long-distance contribution to second order weak amplitudes

Tuesday, 15 June 2010 08:30 (20 minutes)

The calculation of the long-distance contribution to the $K^0\text{-}\overline{K}_0$ mass matrix is divided into three parts: First, the calculation of the matrix element between kaon states of the product of two space-time integrated, $\Delta S = 1$, four-quark weak operators. Second an RI/MOM subtraction to remove the short distance part of this matrix element in a fashion consistent with the calculation of the physical short distance part. Third an application of the Lellouch-Lüscher method, generalized to second order in the weak interactions, to control finite volume errors. Such an approach promises to permit accurate lattice calculation of the $K_L\text{-}K_S$ mass difference and the long-distance contributions to ϵ_K .

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talk

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