



Contribution ID: 58

Type: **not specified**

Negative-Frequency Modes in Quantum Field Theory

Wednesday, 3 December 2014 15:40 (30 minutes)

We illustrate a number of interesting features of a nominal departure from standard quantum field theory, constructed so as to permit momentum eigenstates of both positive and negative energy. Postulating an additional discrete symmetry of the free field theory under the interchange of positive- and negative-frequency modes, we show that one can obtain tree-level source-to-source amplitudes that are manifestly causal, whilst being consistent with the standard S-matrix results. In addition, we highlight intriguing possibilities for both the naturalness and cosmological constant problems. Finally, we draw attention to potential issues with perturbative unitarity and Bloch-Nordsieck cancellation, commenting on a possible solution provided by resonance phenomena and the breakdown of naive perturbation theory. As a non-trivial example, we recover the Peskin-Takeuchi parametrization of the oblique corrections of the standard electroweak theory.

Primary authors: FORSHAW, Jeffrey (University of Manchester); Dr MILLINGTON, Peter (Technische Universität München (TUM)); Dr DICKINSON, Robert (University of Manchester)

Presenter: Dr MILLINGTON, Peter (Technische Universität München (TUM))

Session Classification: Parallel 5: Strongly Coupled gauge Theories