Contribution ID: **25**   Type: **not specified**

O modelo de Wess-Zumino e sua conexão com ótica quântica

Friday 2 December 2016 11:25 (20 minutes)

By an appropriate representation of the fermionic variables in theWess-Zumino quantum mechanics, we show it entails a non-linear generalization of the Jaynes-Cumming (JC) model in quantum optics. Actually, we show that the constraints corresponding to the canonical quantization of the fermionic variables dene a real eight-dimensional manifold and that one point in it realizes the JC model. As is well known, the Jaynes-Cummings model describes the interaction between a single two-level atom and a single-mode radiation eld and it is experimentally realizable in Cavity-QED systems, whereas the Wess-Zumino quantum mechanics is obtained by dimensional reduction from the four dimensional N = 1 supersymmetric Wess-Zumino model. This latter describes the evolution of a complex scalar eld and a fermionic (spin-1/2) eld in four dimensions. Thus, the mapping built up in this work relates two apparently distinct realms, i.e., supersymmetric quantum eld theory and quantum optics, and so it allows the use of superspace techniques in quantum optics, for instance, the supereld path integral formalism.

Tipo de Apresentação

Oral

Presenter: COLLADO, Enrique (UNIFAL - MG)

Session Classification: Comunicações Orais I

Track Classification: Comunicações Orais II