

Abstract Submitted
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A Metric on the Space of Quantum Fields MICHAEL MAROUN,
University of California, Riverside — Over the past 60 years, there have been many attempts at giving a precise mathematical definition of a quantum field. A space of quantum fields is proposed as the space of operator-valued generalized functions and arguments are given justifying the need for such general objects. A metric is then constructed on this space in such a way that it is dynamically defined through the Hamiltonian. This then allows one to keep track of differences between ideal states in interacting theories by comparing them to the corresponding ideal states in asymptotically free theories. For simplicity, an emphasis is placed on scalar φ^4 theory. The metric then allows one to construct geometric and topological attributes in order to find differences that characterize changes between asymptotically free theories to that of interacting ones.

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