Abstract Submitted to the
3rd Conference on Concepts in Electron Correlation
30 September - 5 October, 2005
Hvar, Croatia

The Composite Operator Method and the Hubbard Model

Adolfo Avella, Ferdinando Mancini
Dipartimento di Fisica "E.R. Caianiello" - Laboratorio Regionale SuperMat, INFM
Università degli Studi di Salerno, I-84081 Baronissi (SA), Italy

In the last years, we have been developing a formulation to analyze strongly correlated systems based upon the idea that original electronic fields are just the wrong place where to start and that symmetries should be the guide towards the determination of the right representation where to work. According to this, within the Composite Operator Method we choose as operatorial basis those composite fields capable to describe the effective excitations present in the system under analysis and we use the constraints coming from the complicated algebra closed by the chosen basis to fix the unknown parameters appearing in the calculations. We here show how to apply this formulation to the Hubbard model by presenting two different ways to take into account self-energy contributions to the single-particle properties.

Keywords : Strongly Correlated Systems, Hubbard Model, COM