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Nonminimal macroscopic models of a scalar field based on microscopic dynamics: Extension of the theory to negative masses

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Abstract

© 2015, Pleiades Publishing, Ltd. The article proposes generalizations of the macroscopic model of a plasma of scalar charged particles to the cases of particle interaction with multiple scalar fields and negative effective masses of these particles. The model is based on the microscopic dynamics of a particle in the presence of scalar fields. It appears to be possible to generalize the theory in a natural way by strictly modifying some of its key points depending on the sign of particle masses. Thereby, it becomes possible to remove the artificial restriction contradicting the more fundamental additivity principle for the action functional.

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