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On the Dynamics of the Fermi-Bose model

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Publication date:
2012

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Citation (APA):
Ögren, M. (2012). On the Dynamics of the Fermi-Bose model. Abstract from BIT Circus 2012, Lyngby, Denmark.

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Abstract

In this talk we formulate and prove results for the exponential matrix representing the dynamics of the Fermi-Bose model in an undepleted bosonic field approximation. A recent application of this model is molecular dimmers dissociating into its atomic compounds. The problem is solved in D spatial dimensions by dividing the system matrix into blocks with generalizations of Hankel matrices, here referred to as D -block-Hankel matrices. The method is practically useful for treating large systems, i.e. dense computational grids or higher spatial dimensions, either on a single standard computer or a cluster. In particular the results can be used for studies of three-dimensional physical systems of arbitrary geometry. We illustrate the generality of our approach by giving numerical results for the dynamics of Glauber type atomic pair correlation functions for a non-isotropic three-dimensional harmonically trapped molecular Bose-Einstein condensate.