

Abstract Submitted
for the DPP17 Meeting of
The American Physical Society

The Dynamic Local Field Correction of Yukawa Plasmas

YONGJUN CHOI, The Institute for Cyber-Enabled Research, Michigan State University, GAUTHAM DHARUMAN, MICHAEL MURILLO, CMSE, Michigan State University — The mean-field approximation is the cornerstone of modern statistical mechanics; therefore, unknowns are “beyond mean field” (BMF). Being tantamount to solving the complete many-body problem, however, few accurate BMF models exist even for simplified systems. Knowing the exact representation for the dynamics of a model system provides an important constraint on model validation and an exact limit. The dynamic local field correction (DLFC) is a complex function of wave vector and frequency in which all BMF information is contained. All collisional (e.g., wave damping, transport, equation of state, etc.) information is contained in the DLFC, since it represents the exact solution of the many-body problem. From these two functions (real and imaginary parts) we can validate theoretical models and compute many physical properties (e.g., wave dispersions). In this research, the DLFC will be obtained through molecular dynamics simulations on the Yukawa plasmas. The study covers full range of coupling and screening regimes.

Yongjun Choi
The Institute for Cyber-Enabled Research, Michigan State University

Date submitted: 14 Jul 2017

Electronic form version 1.4