

Abstract Submitted
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Quasi-Localized Charge Approximation for Strongly Correlated Plasmas in Traps¹ HANNO KÄHLERT, Heinrich-Heine Universität Duesseldorf, MICHAEL BONITZ, Christian-Albrechts-Universität zu Kiel, GABOR KALMAN, Boston College — Over the last two decades, the Quasi-Localized Charge Approximation (QLCA) has been successfully applied to investigate the dielectric properties of various strongly coupled systems [1]. While these earlier studies focused on bulk properties, we are concerned with the application of the QLCA to finite inhomogeneous systems. These situations are commonly encountered in ion trap plasmas, ultra-cold neutral plasmas, or dusty plasmas. Starting from the microscopic Lagrangian, we derive an equation for the fluid displacement field and compare our results with previous calculations [2] and a theory for strongly correlated ion plasmas [3]. Since the QLCA accounts for correlation effects, it improves upon so-called “cold-fluid” theories and should allow to reduce the discrepancies between the latter and molecular dynamics simulations in a confined Yukawa plasma [4]. Here, we present our first results.

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