

Abstract Submitted  
for the DPP10 Meeting of  
The American Physical Society

**Molecular dynamics simulation of ultracold neutral plasma**<sup>1</sup> LI GUO, RONGHUA LU, Shanghai Institute of Optics and Fine Mechanics (Chinese Academy of Sciences), SHENSHENG HAN — The ultracold neutral plasma is generated by photoionizing a ultracold gas, the typical electron and ion temperature are around  $1 \sim 1000K$  and  $1K$  respectively. The UNP pave the way towards an unexplored field of ultracold ionized gases and allow the discoveries of a series of new phenomena in atomic physics as well as in plasma physics. One of the motivations of studying ultracold plasmas is the fact that the ultracold plasma is a strongly coupled system. Disorder- induced heating (DIH) is one of the main reasons reducing the coupling strength in ultracold plasma. We demonstrate a numerical simulation for the dynamics of the ultracold plasmas using classical molecular dynamics method with open boundary. The simulation results of plasma expansion and DIH for different initial conditions are presented.

<sup>1</sup>Supported by the National Science Foundations of China under No.10705042.

Ronghua Lu  
Shanghai Institute of Optics and Fine Mechanics  
(Chinese Academy of Sciences)

Date submitted: 16 Sep 2010

Electronic form version 1.4