

Abstract Submitted  
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**Cooling expansion in an inhomogeneous ultracold plasma created by using space shaped laser pulses.** VIKRAM DHARODI, MICHAEL MURILLO, Michigan State Univ — The ultracold neutral plasmas (UCNP) are created by photoionizing the laser cooled atoms. Here, our main goal is to enhance the coupling strength of UCNP and also try to mitigate the disorder induced heating (DIH). For this, we considered an inhomogeneous UCNP which has been created by using the space shaped laser pulses. An adiabatic expansion of this UCNP from higher dense regions to lower dense regions have been studied. A particle based approach has been employed to explore the dynamical evolution of UCNP. The lighter electron density is presumed to follow the Boltzman relation while the heavy ions interact through a Yukawa potential. The spatial average properties (central moments) like density, velocity and temperature have been studied. In the preliminary results, it is observed that as the ions undergo expansion, ion temperature gets lower in higher density regions and vice versa. Several cases of ion flow configuration have been considered for this study.

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