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Void formation and closure under microgravity for different gases
VICTOR LAND, Center for Astrophysics, Space Physics and Engineering Research, Baylor University, Waco, TX 76798, USA, DIANA BOLSER, Participant in Baylor University's Summer Undergraduate Research Program, LORIN MATTHEWS, TRUELL HYDE — A self-consistent 2D dusty plasma fluid model used to model micro-gravity experiments in argon has been extended to allow the modeling of dusty plasmas in additional noble gases, including helium, krypton, neon, and xenon. The electron transport coefficients were obtained using BOLSIG+[1], whereas the ion transport coefficients were obtained from many literature sources, together with the thermal conductivity of the gases and the thermal accommodation coefficients. In this presentation we focus on the formation and closure of voids in microgravity experiments at different pressures and driving potentials, with the different noble gases. The goal is to provide a two-dimensional plot of the pressures and potentials at which 3D dust clouds under microgravity contain a dust-free void, or are void-free, for different carrier gases. This plot could serve as a road map for future experiments.

[1] G. J. M. Hagelaar and L. C. Pitchford, Plasma Sources Sci. Technol. 14 (2005) 722-733

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