

Abstract Submitted
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Self-consistent fluid-plasma simulation in small spaces MANISH JUGROOT, Royal Military College of Canada — There is a great interest in understanding fluids and plasmas in small spaces as the complexity of micro technology systems increases. A self-consistent model of charged and fluid particle dynamics is applied to atmospheric small space ($200\ \mu\text{m}$) discharges in helium. Hydrodynamic transport equations of the self-consistent model are described with an emphasis on the different terms involved in the close coupling among the fluid species, charged species and the electric field. The discharges are studied from an initial cloud till the stages of charged particle over-amplification in small spaces where transients are particularly important. Gas heating, neutral depletion and electric field reversals are observed, highlighting the close interaction between fluid and charged species – both effects therefore characterize and govern the evolution of the small space discharge.

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