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Simulation of electrospray cone-jet mode for electric propulsion applications MANISH JUGROOT, MARTIN FORGET, Royal Military College of Canada — Understanding the space and time-dependant dynamics of the initiation of electrosprays is highly interesting especially for highly conductive fluids. A multicomponent model, coupling fluid dynamics, charged species dynamics and electric field is applied to flows in capillaries and externally-wetted needles. The simulations describe the charged fluid interface with emphasis on cone-jet transition under the effect of an electric field. The time evolution capture of the interface highlights the close interaction among space charge, coulombic forces and the surface tension in the small scale flows. Droplet, cone-jet and ion modes will be discussed with potential applications to colloid electric spacecraft propulsion.

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