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Plasma Jet Simulations Using a Generalized Ohm's Law

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Abstract: Plasma jets are important physical phenomena in astrophysics and plasma propulsion devices. A currently proposed dual jet plasma propulsion device to be used for ISS experiments strongly resembles a coronal loop and further draws a parallel between these physical systems [1]. To study plasma jets we use numerical methods that solve the compressible MHD equations using the generalized Ohm's law [2]. Here, we will discuss the crucial underlying physics of these systems along with the numerical procedures we utilize to study them. Recent results from our numerical experiments will be presented and discussed.

[1] T. Glover, et al., The VASIMR® VF-200-1 ISS Experiment as a Laboratory for Astrophysics, Poster SM51C-1831, AGU Fall Meeting, San Francisco, December 13-17, 2010.

[2] F. Ebersohn, J. V Shebalin, S. Girimaji and D. Staack, Magnetic Field Effects on Plasma Plumes, Paper O2-404, 39th EPS Conference on Plasma Physics, Stockholm, July 2-6, 2012.