

Abstract Submitted  
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**Links between vortex formation and ambipolar flow in 2D ICP fluid simulations**<sup>1</sup> DAVID URRABAZO, MATTHEW GOECKNER, University of Texas at Dallas — Recent results by Bogdanov, et al., have suggested the presence of vortices within discharges. They have reported that these are related to a gradient in the electron temperature. We have also examined these vortices via fluid simulation of an ICP discharge developed with COMSOL 3.5a and Matlab. We will show via an examination of the curl of the electron flux that the source of the vortices is more complex than what was reported by Bogdanov, et al. Specifically, we will show that the source is via several channels - often tied to the electron temperature profile but not necessarily directly related to the profile. Further, as the components related to these vortices are removed, the classic fluid model is reduced to the ambipolar model. This suggests that there are other ways to envision the ambipolar model outside of the requirement for flux congruence.

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