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Empirical Model for Ion Flows Around Jupiter During the Galileo Mission AUSTIN EGERT, JARED BELL, HUNTER WAITE — Jupiter's intense magnetic field is second only to the solar magnetic field. This intense field surrounds and permeates a robust magnetospheric plasma that co-rotates with the planet out to several Jovian (radii), R_J, until a multitude of processes cause the co-rotating plasma to lag (Hill [1979]). The complex plasma dynamics produce a system of field aligned currents and electric fields that map down into Jupiter's upper atmosphere. It is currently believed that this mapping of these convection electric fields play a dominant role (if not the dominant role) in determining the energy balance for Jupiter's entire upper atmosphere. For this poster, we present an empirically based model of the Jovian plasma motion, focused on reproducing in qualitative and quantitative terms the measured ion flows from Galileo (Krupp et al. [2007]). Using this empirical ion flow model, we plan to construct a semi-empirical model for the mapping of convection electric fields into Jupiter's upper atmosphere. This electric field model will be used to drive ion dynamics and thermal balance calculations in a newly developed Jovian Global thermosphere-ionosphere model (J-GITM), which will be used to support the upcoming Juno mission.

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