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Analytic representations of high-altitude auroral H^+ and O^+ densities, flow velocities and temperatures in terms of drivers for incorporation into global magnetospheric models[1] JAMES HORWITZ, WEN ZENG, Department of Physics, The University of Texas at Arlington, Arlington, Texas 76019 — As new methods of describing multiple fluid species and other advances enhance the capability of global magnetospheric models to simulate the dynamics of multiple ion species, they also allow more accurate incorporation of ionospheric plasma outflows as source populations into these large scale models. Here, we shall describe the distilled results of numerous physics-based simulations of ionospheric plasma outflows influenced by auroral driving agents in terms of compact analytic expressions in terms of precipitation electron energy flux levels, characteristic energy levels of the precipitating electrons, the peak spectral wave densities for low-frequency electrostatic waves which transversely heat ionospheric ions, and solar zenith angle. The simulations are conducted with the UT Arlington Dynamic Fluid Kinetic (DyFK) ionospheric plasma transport code. We present these analytic expressions for ionospheric origin O^+ and H^+ densities, temperatures and field-aligned flow velocities at the 3 R_E altitude inner boundaries of typical magnetospheric models.

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