

## The sami2py ionospheric model: a Phase 1 AUL project

\*Jeffrey Klenzing<sup>1</sup>, Jonathon Smith<sup>1,2</sup>, Alexa Jean Halford<sup>1</sup>, Michael Hirsch<sup>3</sup>, Joe Huba<sup>1,4</sup>

1. NASA Goddard Space Flight Center, 2. Catholic University of America, 3. Boston University, 4. Symtek

Sami2py is a python module that runs the SAMI2 ionospheric model, as well as archives, loads and plots the resulting modeled values. SAMI2 is a model developed by the Naval Research Laboratory to simulate the motions of plasma in a 2D ionospheric environment along a dipole magnetic field [Huba et al, 2000]. SAMI2 solves for the chemical and dynamical evolution of seven ion species in this environment ( $H^+$ ,  $He^+$ ,  $N^+$ ,  $O^+$ ,  $N_2^+$ ,  $NO^+$ , and  $O_2^+$ ). The python implementation allows for additional modifications to the empirical models within SAMI2, including reduction of the exospheric temperature in the NRLMSIS thermosphere and the input of custom ExB ion drifts.

The code is open source and available to the community on github. As part of the Application Usability Level (AUL) framework, we will discuss the usability of this code in terms of simple ionospheric applications, including as a core dependence of the “growin” project.

Keywords: ionosphere, model, space weather