

- Compared SAMI3 and SAMI 2 runs with Large Ionosonde Data Base
  - As First Step, Concentrated on Solar Quiet Time and Mid-Latitudes
    - Reduce Number of Drivers
    - Minimizes Dynamic Inputs
  - WHI in 2008 is a historically low period for solar activity
    - Investigated the affects that unknowns in empirical atmospheric model has on ionospheric densities
- Systematic differences Between the Ionosonde Data and the SAMI3 model at Mid-Latitudes
  - Daytime
    - SAMI3 has F2 peak densities too low
    - SAMI3 has F2 peak slightly high
  - Nighttime
    - SAMI3 has F2 peak density too low
    - SAMI3 has F2 peak height too high
- SAMI3 other issues
  - Globally SAMI3 has higher TEC than GPS data, In spite of foF2 (and nmF2) being systematically low
  - SAMI3 sometimes give unrealistic slab thickness (TEC/nmF2)
- SAMI2 runs adjusting MSIS atmospheric parameters (Temperature and Density)
  - Uncertainties in 2008 Solar Minimum Atmosphere do not fully explain systematic differences
    - Reduced Atmospheric Temperature
    - Adjusted MSIS density and temperature to match Solar Minimum 2008 measurements
  - Height differences likely due to drifts and winds
    - Try adjusting ExB Drifts to correct heights
    - Drifts are expected to be smaller during 2008 Solar Minimum
  - Look at recombination rates at high altitudes
    - At high altitude recombination rate proportional to  $N_{H^+} \times N_e$
    - Ionosphere transitions to  $H^+$  at lower altitudes during Solar Minimum