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Modeling the Daily Variability of the Midlatitude Ionosphere with SAMI3/WACCM-X

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ABSTRACT

It is well known that the daily variability of the ionosphere is not captured by climatological or physics-based models such as SAMI3. To address this limitation, we are coupling SAMI3 to the whole atmosphere model WACCM-X. When WACCM-X is driven by atmospheric specifications from operational data analysis systems these effects propagate up into the thermosphere, driving tides in the winds and temperature that have a profound effect on the ionosphere. For this work, we focus on the effect of the daily variability of the ionosphere and its effect on HF radio wave propagation. Midlatitude ionosonde measurements are compared to simulated ionograms that are calculated using both the SAMI3/WACCM-X ionospheric specifications as well as the climatological SAMI3/HWM14 specifications to quantify the daily variability of the F-region bottomside.

Keywords: Ionosphere, Model, Midlatitude, Ionogram

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