ICON satellite observations of thermospheric winds

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ICON is a NASA scientific satellite launched in 2019. It utilizes the Michelson interferometer, called MIGHTI, to observe airglow at two wavelengths: red at 630.0 nm and green at 557.7 nm. Line-of-sight wind speed can be obtained from these airglow emissions. The horizontal wind vector is then obtained using two MIGHTIs observing the same volume from two directions 90 degree apart (with 5-8 min time delay). The green airglow covers the altitude range of 90-300 km, while the red covers 150-300 km. Large observation errors occur near the day-night boundary and the equatorial ionization anomaly. Observation errors in other regions are generally less than 10 m/s.

Using MIGHTI observations during January –December 2020, we examine the local time and seasonal variation of the thermosphere wind and compare it to climatology previously obtained by CHAMP satellite. Initial results clearly reveal a dominant diurnal variation of winds at 250 km, and semi-diurnal variation at 100 km. Detailed results will be presented in the poster.

