

Doppler Wind and Temperature Sounder

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A new approach for measuring high altitude winds and temperatures has been presented by Gordley and Marshall (2011). The technique employs gas filter correlation radiometry from low Earth orbit to simultaneously measure the Doppler shift and line width of emission spectra, from which wind and kinetic temperature can be inferred. The products of the Doppler Wind and Temperature Sounder (DWTS) are profiles of daytime and nighttime temperature and cross-track winds between 25 to 250 km with less than 2% uncertainty, at intervals of 10 km along-track. Above 110 km and below 50 km, the along-track wind component is also determined, thus enabling recovery of the horizontal vector wind. DWTS measurements therefore far exceed current capabilities. We present several DWTS sampling scenarios and demonstrate its capability to retrieve planetary-scale variations in global temperature and vector winds.