

#9 Received 12/08/2014

McNamara, Leo; Dao, Eugene V.; Colman, Jonah J.  
U.S. Air Force Research Laboratory (AFRL/RVB), Kirtland AFB, Albuquerque, N.M. 87111

### **Digisonde Observations at WSMR for Day 026, 2014**

#### Abstract:

AFRL deployed four Digisondes at White Sands Missile Range during the IARPA/HFGeo campaign of January 2014. Ionograms and Skymaps were recorded on alternate minutes during the day (15-23UT), for days 018 through 028. Very large TIDs were observed on each day, so the Digisonde observations provided a 4-station network of TID observations, in terms of the virtual heights of the autoscaled ionogram traces, the real heights of the deduced plasma frequency profiles, and the local tilts corresponding to a sounding frequency of ~5.2 MHz (base of the F2 layer).

The large-scale TIDs had periods of ~60 minutes, with superimposed smaller-scale TIDs that had periods of ~15-20 minutes. The large TIDs traveled basically from north to south. As seen in real-height contour plots, the amplitudes of the TIDs increased upwards by a factor of ~2 over the F2 layer. The changes with time of the F2 peak height (hmF2), F2 peak height (Hm), peak plasma frequency (foF2), and sub-peak TEC were all correlated. As the TID progressed, the peak of the layer rose to greater altitudes, foF2 increased, the sub-peak TEC increased, and the F2 scale height increased. Then as the peak of the layer fell again, the sub-peak TEC and the scale height also decreased.

The large-scale TIDs were not obviously related to activity in the auroral zone, although large-scale TIDs were also recorded by east and west coast ionosondes at Eglin AFB and Point Arguello. Similar ~20 minute medium-scale TIDs were also seen by a previous generation of geolocation equipment [DragonFix, circa 1990]. These TIDs were probably due to local topography.