

## **C/NOFS Daytime ExB Drift Velocity Measurements Compared With Ground-based Magnetometer-inferred ExB Drift Velocity Observations in the Peruvian Sector**

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A technique to determine realistic, daytime, vertical ExB drift velocities in the equatorial, ionospheric F-region has recently been developed. It has been established that taking the difference in the horizontal components ( $\Delta H$ ) between a ground-based magnetometer on the magnetic equator and one 6-9° away in magnetic latitude, provides these realistic velocities. Relationships between the  $\Delta H$  values from the magnetometers at Jicamarca, Peru (1° N. mag. lat.) and Piura, Peru (6.5° N. mag. lat.) and the observed daytime ExB drift velocities from the JULIA (Jicamarca Unattended Long-term Ionosphere Atmosphere) coherent scatter radar have been developed and then applied, on a day-to-day basis, to obtain daytime, vertical ExB drift velocities between 0700 and 1700 LT in the Peruvian longitude sector. We briefly describe the  $\Delta H$ -inferred ExB drift technique and demonstrate that the  $\Delta H$  vs ExB drift relationship obtained in the Peruvian sector can be applied in other longitude sectors where appropriately-placed magnetometers exist. We then describe a study where we compare the  $\Delta H$ -inferred ExB drift velocities obtained in the Peruvian sector with the CINDI/IVM (Ion Velocity Meter) and the DC VEFI (Vector Electric Field Experiment) observations in the Peruvian sector during the months of August, September and October, 2008. The local time of the observations range between 0900 and 1600 LT. The IVM velocity component and the VEFI electric fields perpendicular to B in the magnetic meridional plane are calculated and transformed to the apex altitude at the magnetic equator. The fact that daytime, vertical ExB drift velocities at the magnetic equator are essentially independent of altitude between 150 km and 800 km simplifies the comparisons with the  $\Delta H$ -inferred ExB drift observations. It is important to validate the IVM and VEFI observations with a number of different ground-based ExB drift measurements and, while the Jicamarca ISR and JULIA are available, they are sporadic and all in one longitude sector. In contrast, the magnetometer-inferred ExB drift technique is available, continuously, day-to-day. In addition, the same technique can be used to validate VEFI and IVM daytime observations at other longitude sectors such as the Brazilian, African, Indian, Philippine and Indonesian sectors where appropriately-placed magnetometers already exist.