

DAY-TO-DAY VARIABILITY IN DAYTIME, VERTICAL EXB
DRIFT VELOCITIES AT TWO CLOSELY SPACED, LONGITUDE
SECTORS

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A recent study has quantitatively established the relationship between the vertical daytime ExB drift velocity in the ionospheric F region and the DH values measured by two magnetometers in the South American (west coast) longitude sector. Magnetometer H component observations from Jicamarca (0.8 N. dip lat.) and Piura (6.8 N. dip lat.) in Peru and daytime, vertical ExB drift velocities measured by the Jicamarca Unattended Long-term Ionosphere and Atmosphere (JULIA) radar have been used to establish this relationship. The magnetometer observations and the JULIA 150 km echo ExB drift measurements were obtained for the period between January, 2001 and December, 2004. It has also been demonstrated that the DH vs ExB drift relationships derived in the Peruvian longitude sector can be applied in the Philippine longitude sector to provide realistic ExB drift velocities that, for quiet days, compare favorably with the Fejer-Scherliess, climatological ExB drift model. In the Philippine sector, magnetometers located at Davao (125.4 E. geog. long., 1.4 S. dip lat.) and Muntinlupa (121.0 E. geog. long., 6.3 N. dip lat) provided the daytime DH values that were used to infer the vertical ExB drift velocities at this longitude. Expanding on these studies, this investigation now examines the day-to-day variability in vertical ExB drift velocities in both the Philippine and Indonesian longitude sectors. Between January, 2001 and December, 2004, there are over 450 geomagnetically quiet days ($A_p \leq 10$) and more than 230 geomagnetically disturbed days ($A_p \geq 20$). Magnetometer observations from Davao and Muntinlupa in the Philippines and from Yap (138.5 E. geog. long., 10 N. dip lat.) and Biak (136.0 E. geog. long., 9.7 S dip lat.) in Indonesia provide the DH-inferred ExB drift velocities for these quiet and disturbed days. Specific questions that will be addressed are: 1.) How do the DH-inferred ExB drift velocities compare between the two longitude sectors on a day-to-day basis, 2.) How do the quiet-day average ExB drift velocities compare with the Fejer-Scherliess climatological model, 3.) For disturbed days, are the magnitudes of the prompt penetration electric fields in the Philippine sector consistent with the observations in the Indonesian sector? The impact of these results on Space Weather, low latitude, theoretical and operational ionospheric models will be discussed.

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