Geophysical Research Abstracts, Vol. 8, 04416, 2006
SRef-ID: 1607-7962/gra/EGU06-A-04416

Climatology and IMF By dependence of quiet-time high-latitude upper thermospheric winds measured by ground-based Fabry-Perot Interferometers in the northern and southern hemispheres

J. T. Emmert (1), G. Hernandez (2), M. J. Jarvis (3), R. J. Niciejewski (4), D. P. Sipler (5), S. Vennerstrøm (6)

(1) Naval Research Laboratory, Washington, DC, USA, (2) University of Washington, USA, (3) British Antarctic Survey, Cambridge, UK, (4) University of Michigan, USA, (5) MIT Haystack Observatory, Massachusetts, USA, (6) Danish National Space Center, Copenhagen, Denmark (john.emmert@nrl.navy.mil)

We analyze ground-based Fabry-Perot interferometer observations, obtained from the CEDAR database, of upper thermospheric ($\sim$250 km) horizontal winds derived from Doppler shifts in the 630.0 nm (red line) nightglow. The winds were measured over the following locations: South Pole (90S), Halley (76S, 27W), Millstone Hill (43N, 72W), Søndre Strømfjord (67N, 51W), and Thule (77N, 68W). We derive climatological quiet-time (Kp $<$ 3) wind patterns as a function of local time, solar cycle, day-of-year, and the y-component of the interplanetary magnetic field (IMF By). In magnetic coordinates, the quiet-time high latitude wind patterns are dominated by anti-sunward flow over the polar cap, with wind speeds that generally increase with increasing solar EUV irradiation. Within the limited seasonal coverage afforded by the nighttime (mostly winter) data, the day-of-year dependence is generally weak. IMF By exerts a strong influence on the wind patterns, particularly in the midnight sector. During winter, positive-By winds around midnight in the northern (southern) hemisphere are directed more toward the dusk (dawn) sector, compared to corresponding negative-By winds; this behavior is consistent with the By-dependence of statistical ionospheric convection patterns The strength of the wind response to IMF By tends to increase with increasing solar EUV irradiation, roughly in proportion to the increased wind speeds. Quiet-time IMF By effects are detectable at latitudes as low as that of Mill-

stone Hill (magnetic latitude 53N).