ponents of both the EW and NS winds show larger amplitudes with minima in April and October.

(b) Phase variations: Variations of the monthly mean phases of the diurnal and semidiurnal components of the EW and NS winds are shown in figures 3(a) and 3(b) respectively. In figure 3(c) are shown the monthly progression of the phase difference between the EW and NS components reckoned in hours ($\Delta\phi = \phi_{EW} - \phi_{NS}$). It shows that the sense of rotation of semidiurnal tidal wind vector is clockwise throughout the year; the phase difference is about six hours in September, which corresponds to a rotation of 180°. The sense of rotation of diurnal tidal wind vector is anti-clockwise in early summer and clockwise during the rest of the year. It shows the maximum phase difference of about four hours in October. The monthly mean phases of semidiurnal component of the EW wind are in agreement with the results reported by Roper and Salah[4] for Atlanta (34°N, 84°W) and Manson *et al*[6] for Saskatoon (52°N, 107°W) whereas the NS wind does not show such agreement

CONCLUSIONS

Analysis of the meteor wind data gathered at Kuhlungsborn, a high-midlatitude station, shows that:

(i) The mean monthly EW and NS wind components have seasonal variations with zonal wind minima in April and October.

(ii) Diurnal and semidiurnal tidal components of the EW and NS winds have minimum amplitudes during equinoctial months (April and October).

(iii) The semidiurnal wind vector rotates in the clockwise direction throughout the year; the diurnal wind vector also rotates likewise during most of the year.

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1. Elford, W. G., *Planet. Space Sci.*, 1959, **1**, 94.
2. Lysenko, I. A., Kashcheyev, B. L., Karimov, K. A., Nazarenko, M. K., Orlyansky, A. D., Fialko, E. I., and Chebotarev, R. P., Izv., *Atmos. Ocean Phys.*, 1969, **5**, 893.
3. Devara, P. C. S., *Study of upper atmospheric winds and radio meteors using meteor wind radar technique*. Ph.D. Thesis, Andhra University, Waltair, 1979.
4. Roper, R. G., and Salah, J. E., *J. Atmos. Terr. Phys.*, 1978, **40**, 879.
5. Dartt, D., Nastrom, G. and Belmont, A., *J. Atmos Terr. Phys.*, 1983, **45**, 707.
6. Manson, A. H., Meek, C. E., and Gregory, J. E., *J Atmos. Sci.*, 1983, **40**, 969.
7. Balsley, B. B., and Gage, K. S., *PAGEOPH*, 1980, **118**, 452.
8. Portnyagin, Yu. I., Greisiger, K. M., Dyachenko, V. A., Makarov, N. A., Lysenko, I. A. and Sprenger, K., *Meteorology*, 1980, **30**, 338.
9. Chapman, S. A., and Lindzen, R. S., *Atmospheric tides, Thermal and Gravitational*, D. Reidel. Dordrecht, Netherlands (1970).

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