RESPONSES OF THE ELIASSEN-PALM FLUX TO THE PASSAGE OF SOLAR SECTOR BOUNDARIES (Abstract)

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Responses of planetary waves to the passage of solar sector boundaries (SSB) are studied by use of the Eliassen-Palm (E-P) flux. Reported responses to the passage are as follows: The vorticity area index (VAI) dips on the first day after the passage (J. M. WILCOX *et al.*: J. Atmos. Sci., **31**, 581, 1974), and the polar temperature reaches a minimum on the passage date in the troposphere (Y. MISUMI: J. Meteorol. Soc. Jpn., **61**, 686, 1983) and 2.5 days after that in the stratosphere (Y. MISUMI: Abstract, IAMAP, Hamburg, 1981). The E-P flux is useful to study variations of waves, because its divergence indicates the influence of waves on the zonal mean field and its direction shows that of the wave group velocity on the meridional plane. Results mentioned below were obtained in winters from 1964 to 1972.

It is found that, from 4.5 to 0.5 day before the passage of SSBs, the divergence of the E-P flux occurs between 60 and 70°N in the 200–500 mb layer. The southward residual mean meridional flow due to this divergence is enough to give rise to a residual mean upward flow which decreases temperature in the polar troposphere. The E-P flux divergence is caused by decrease of E-P flux vertical components for zonal wave numbers 2 and 3 in the troposphere, which propagate to the stratosphere. Especially, the decrease of wave number 2 and that of wave number 1 at the 150 mb level reach the middle stratosphere and create a minimum of polar temperature there.

On the passage date E-P flux convergence appears in the 200–500 mb layer. This convergence is diagnosed by the reflective index changed by the divergence mentioned above and brings about the VAI response.

The continuing decrease of the E-P flux is completely expressed by the internal atmospheric dynamics, without external forcings or modulations. However, decreases cannot be diagnosed by the reflective index and are accompanied by small variation of the kinetic and available potential energy.

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STRATOSPHERIC CIRCULATION IN THE SOUTHERN HEMISPHERE (Abstract)

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By the use of stratospheric geopotential height and temperature field data obtained from the TIROS satellite, the dynamical interaction between planetary waves and zonal mean winds in the southern hemisphere stratosphere is investi-