

ON THE RELATIONSHIP BETWEEN THE OLR DISTRIBUTION
PATTERN OVER ANTARCTICA AND THE VARIATION OF
ATMOSPHERIC CIRCULATION IN THE SOUTHERN TROPOSPHERE
(ABSTRACT)

Naohiko HIRASAWA and Takashi YAMANOUCHI

National Institute of Polar Research, 9-10, Kaga 1-chome, Itabashi-ku, Tokyo 173

We found two dominant patterns of OLR (outgoing longwave radiation) distribution over Antarctica in 5-day averaged fields in the wintertime. In the low OLR period, the contours in the OLR distribution are parallel to the topographic contour lines, accompanied with a minimum OLR area over the ridge area in Eastern Antarctica. In the high OLR period, the minimum OLR area over the ridge is not conspicuous and the OLR over Antarctica are close to uniform values except for the coastal region.

This OLR variation is related to a variation of hemispheric-scale atmospheric circulation in the southern troposphere. In the low OLR period, the circumpolar westerly Jet along 60°S at the 500 mb level is established and the polar vortex is strengthened. In the high OLR period, the westerly Jet shifts around 45°S, the polar vortex is weakened and a high appears over the ridge area in eastern Antarctica. The atmospheric variation above corresponds to the transition between the single-Jet and double-Jet regime by M. SHIOTANI (J. Meteorol. Soc. Jpn., 68, 461, 1990). The katabatic wind at Mizuho varies in good correspondence with the variation of the OLR distribution such as the weak katabatic wind at the low OLR period and the strong at the high.

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