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PINATUBO ERUPTION EFFECT OBSERVED AT SYOWA STATION, EAST ANTARCTICA (ABSTRACT)

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The direct and indirect effects on solar radiation, temperature and ozone due to volcanic eruptions of Mt. Pinatubo and Mt. Hudson in 1991 were analyzed based on radiation and meteorological observations at Syowa Station (69°S, 40°E), east Antarctica.

The direct effect is seen in solar radiation components. The normal incident solar radiation was decreased as much as 30% of normal value in December 1991, while the diffuse solar radiation increased 50%. In December 1992, the decrease of normal incident radiation fell 20% and the increase of diffuse radiation fell 30%.

The indirect effect is thought to appear in atmospheric temperature and stratospheric ozone. At the altitudes where volcanic aerosol is injected, atmospheric temperature will be raised and at the altitudes below that, the temperature will drop. From Syowa station aerological data, there was little temperature increase in the lower stratosphere 6 months after the eruptions. The annual mean surface temperature of Syowa in 1991 and 1992 was both −9.9°C, in 1993 it became −11.8°C. The annual mean value of total ozone observed at Syowa in 1993 was almost the same as in the previous few years, but in 1994, it recorded its lowest value.

From Syowa Station data, the direct effect of the eruptions on solar radiation components appeared quickly, within 6 months, and the magnitude was almost the same as shown by global observations. The indirect effect on atmospheric temperature or total ozone seems to be weakened or postponed compared to the global appearance.

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AN ANALYSIS OF METEOROLOGICAL DATA IN THE INLAND AREA OF ANTARCTICA (ABSTRACT)

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This study is based on data sets in winter in 1983 of ECMWF 500 hPa height field and meteorological observations at surface level at Mizuho Station. The indicators of cloudiness and temperature at the surface in the Antarctic interior are those at Vostok station.

From the daily data, it is found that the katabatic wind at the Mizuho Station is strong and surface temperature in the inlaid area of Antarctica is high while a strong high pressure system at the 500 hPa level appears over East Antarctica. This situation suggests the existence of downward flow in the lower level over the inland area of Antarctica, which is a compensational flow and induces adiabatic heating. The evolution of the high pressure system is partly associated with a variation in the hemispheric-scale circulation system, shown by N. HIRASAWA and T. YAMANOUCHI (Proc. NIPR Symp. Polor Meteorol. Glacciol., **9**, 193, 1995).

It is noted that cloudiness in the inland area is larger in during the high pressure than during the low pressure. This situation suggests that when strong katabatic wind induces strong conpensational downward flow, the downward flow is not always predominant from top to bottom of troposphere. However, the mechanism in the relationship between the atmospheric circulation in the lower level and the increase in cloudiness is left to be solved.

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