

MORPHOLOGY OF SNOW CRYSTALS AND ICE NUCLEI AT LOW TEMPERATURES (Abstract)

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The effect of ice nuclei mainly on the formation of snow crystals of cold temperature types (peculiar shapes) was examined experimentally. Ice nuclei (rock-forming minerals, clay minerals and silver iodide) were adhered on a fine fiber and snow crystals were formed on them in the cold chamber. Experimental results are as follows: 1) Several rock-forming minerals and clay minerals were not easy to nucleate even at -30°C . 2) Peculiar shapes of snow crystals were formed easily on the mineral particles whose symmetry was not fitted crystallographically. 3) The larger the size of ice nuclei the higher was the production rate of peculiar shapes of snow crystals. 4) Peculiar shapes of snow crystals were formed more on initial nucleation than on secondary nucleation (memory effect). Some considerations were made on these results.

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PRECIPITATION FLUCTUATION IN PATAGONIA AND THE ATMOSPHERIC CIRCULATIONS OF THE MIDDLE-HIGH LATITUDES IN THE SOUTHERN HEMISPHERE (Abstract)

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Correlative analysis of this study reveals the relationship between the precipitation fluctuations of the Patagonia Icefield and the atmospheric circulations of the middle-high latitudes of the Southern Hemisphere. The atmospheric circulations of 3 and 2 wave-number patterns at the 500 mb level strongly influence precipitation in Patagonia during the winter season. Heavy winter precipitation is often associated with the extended upper air trough from the Antarctic Peninsula. The composite map of sea level pressure also shows that an upper air trough over Tasmania causes to form depressions in the southern part of the South Pacific. These depressions bring heavy precipitation to Patagonia. The above-mentioned 2 wave-number pattern influences the summer precipitation in Patagonia. The synoptic correlation maps also indicate the strengthened jet stream existing over Patagonia in the case of heavy precipitation. The atmospheric circulations of middle-high latitudes caused by geographical conditions of the Antarctic Continent are evident in the precipitation fluctuations of Patagonia.

The long-term fluctuation of winter sea level pressure in the middle latitude zone of the Southern Hemisphere shows high zonality and agrees well with the long-term fluctuation of accumulated snow at the South Pole and the sea-ice area (J. O. FLETCHER: Memorandum RM-5793-NSF, RAND Corporation, 39, 1969). The increase in accumulation of snow at the South Pole and the spread of sea-ice around Antarctica are associated with the sea level pressure decrease