coating was probably not uniform on the film surface. An attempt to check this point is being carried out.

(*Received February 3, 1990; Revised manuscript received April 2, 1990*)

THE DOUBLE-JET AND SEMI-ANNUAL OSCILLATIONS IN THE SOUTHERN HEMISPHERE SIMULATED BY THE METEOROLOGICAL RESEARCH INSTITUTE GENERAL CIRCULATION MODEL (ABSTRACT)

Akio KITOH, Koji YAMAZAKI and Tatsushi TOKIOKA

Meteorological Research Institute, 1–1, Nagamine, Tsukuba 305

The tropospheric circulation in the Southern Hemisphere has some remarkable features such as a deep circumpolar trough throughout the year, a double-jet in winter months and large semi-annual components in the fields of sea-level pressure and zonal wind. A 12-year integration with the Japan Meteorological Research Institute general circulation model is presented and compared with 9-year observations for the period 1979–1987.

The simulated meridional temperature gradient in July has two maxima, one at 30°S in the upper troposphere and the other at 60°S in the lower troposphere. The horizontal distribution of the strong baroclinic zone is not zonally uniform. The simulated zonal wind at 500 mb in July shows double-jet structures in the Pacific sector, one at 30°S and the other at 60°S, and only one jet in the Atlantic and Indian sectors, corresponding to the observation. There is a large wavenumber 1 stationary eddy field at 60°S with a trough in the Indian Ocean and a ridge in the Pacific, in accordance with the double-jet in the latter. Two strong baroclinic zones in the Pacific sector can be seen from May to October, while there is only one in the Pacific sector during the rest of the year. The seasonal change of the zonal wind follows it. Between 50°S and 60°S, baroclinity becomes strong twice a year during spring and fall, leading to the semi-annual oscillation in the fields of the zonal wind and sea-level pressure. A good simulation of the stationary eddies and the seasonal cycle of the Antarctic temperature field such as a rapid cooling in autumn of the Antarctic lower troposphere, a coreless winter and coldest atmosphere in early spring, is crucial to a successful simulation of the winter double-jet structures and the semi-annual oscillations in high southern latitudes.

(*Received November 9, 1989*)

RADIATIVELY DETERMINED TEMPERATURE IN THE MIDDLE ATMOSPHERE IN THE POLAR REGION (ABSTRACT)

Kiyotaka SHIBATA

Meteorological Research Institute, 1–1, Naganime, Tsukuba 305

Radiatively determined temperature, *i.e.*, time-marched temperature under the absence of dynamical warming, in the middle atmosphere is investigated for various conditions. The model