

MODELING OF POLAR STRATOSPHERIC CLOUDS (ABSTRACT)

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Formation of polar stratospheric clouds (PSCs) is simulated assuming that they consist of H₂O ice particles. Stratospheric aerosols are assumed to work as the ice-forming nuclei if the supersaturation ratio exceeds the critical values determined from aerosol size. Growth of the PSC particles is computed using the condensation equations.

Two cases of cooling rates of the atmosphere are tested. One is 1.0 K/day, and the other is 0.25 K/day. The number concentration of the PSC particles ranges between 0.1 and 0.4/cm³, and the particle size ranges between 4 and 6 μm. Further inspection shows that the particles are larger in number concentration but smaller in particle size when the larger cooling rate is used.

A simulation is also carried out for the temperatures measured in the Antarctic winter of 1980 incorporating the fall effect of PSC particles. The result shows that growth of the PSC particles is restricted by the fall effect, particularly in the upper part of the PSC layer.

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GIANT PARTICLES IN THE LOWER STRATOSPHERE (ABSTRACT)

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Polar stratospheric clouds (PSCs) are well known phenomena in the lower polar stratosphere. Using the data of balloon flights at McMurdo Station, Antarctica, D.J. HOFMANN *et al.* (*J. Geophys. Res.*, **93**, 665, 1988) and D.J. HOFMANN (*Nature*, **337**, 447, 1989) have recently showed vertical profiles of aerosol above the altitude of 10 km. The upper limit of the particle size of their measurements was less than about 1 μm. We present here the results of balloon observations for measuring relatively large particles (more than 10 μm) in the lower stratosphere. The sounding instrument of particles was similar in design to that described by M. MURAKAMI *et al.* (*J. Meteorol. Soc. Jpn.*, **65**, 803, 1987) called Cloud Particle Video Sonde (CPVS), whose main device was a TV camera. Four balloon flights for sounding stratospheric particles were carried out on May 28, August 5, August 20 and September 2 in 1988 at Syowa Station (69°S, 40°E), Antarctica. Giant particles which look like liquid particles were found on pictures transmitted from the TV camera ascending with the balloon. The size of the largest one was about 150 μm diameter. Particles of more than 100 μm diameter were found every flight in the lower stratosphere.

There is a possibility that the film does not show liquid particles, but non-uniformity of the surface of the film itself, because CPVS uses water-repellent film for collecting particles and the