



Meteorology and polar stratospheric clouds

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The stratospheric aerosol is an important climatic factor. The polar stratospheric clouds (PSCs) play a considerable role in the mechanism of ozone depletion and ozone holes formation. They are observed in the stratosphere of the north and the south Polar Regions. Polar stratospheric vortex supports the PCS formation. Lidar sounding facilities (ground and airplane based) are used in PSCs researches. As for Russia, there were no lidar stations on a huge polar territory from Spitsbergen to Chukot Peninsula for realizing regular observations of the polar atmosphere.

Regular lidar measurements of PSCs were started in 2004 in Yakutsk [1] and were carried out during last three winters. According to the balloon data and data of Upper Atmosphere Research Satellite (UARS), PSCs were observed at stratospheric temperatures which were significantly higher than the known temperature thresholds of PSC particles condensation. The backward trajectories of air masses passed above Yakutsk at different altitudes at the days of PSCs observation were calculated on the base of wind and temperature UARS data. The analysis has shown that PSCs could be formed 2-6 days before their observation at the lowest temperatures on air mass trajectory. Besides Scandinavia new regions of PSCs formation have been found.

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1. Cheremisin A.A., Kushnarenko A.V., Marichev, Nikolashkin S.V. and Novikov P.V. Meteorological conditions and polar stratospheric clouds over the city of Yakutsk in

winter 2004/05 // Russian Meteorology and Hydrology. – 2007. V.32. N.3. P. 43-53.