

Characterization of Polar Stratospheric Clouds observed with Improved Limb Atmospheric Spectrometer (ILAS)

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Improved Limb Atmospheric Spectrometer (ILAS), an occultation sensor on board the Advanced Earth Observing Satellite (ADEOS), observed the infrared absorption spectra from 6.2 to 11.7 micron with 780-nm extinction in the polar stratosphere (57-72 °N and 63-88 °S) 14 times daily from November 1996 through June 1997. The newest retrieval Algorithm of Improved Limb Atmospheric Spectrometer (ILAS) Version 7 (V7) succeeded to retrieve aerosol/PSCs parameters simultaneously with gas species (Oshchepkov et al. 2005), and Oshchepkov et al. [2006] confirmed validity of V7 retrieval for gaseous species. The algorithm also provided a complete dataset of aerosol/PSC parameters including chemical compositions with their size distributions successfully. In the Antarctic stratosphere, the derived PSC parameters indicate prominent β -Nitric Acid Trihydrate (NAT) with only few occasions of Super-cooled Ternary Solution in early winter of 1997. Most of NAT events were observed between 60°W and 90°E at the ILAS measurement latitude ($\sim 65^\circ\text{S}$) where temperatures are cold enough to reach to the NAT thermodynamic equilibrium temperature, $T(\text{NAT})$. The result is consistent with the 'NAT-belt' observed with Michelson Interferometer for Passive Atmospheric Sounding (MIPAS) in the winter of 2003 downstream from the Antarctic Peninsula [Hoepfner et al., 2005]. On the other hand, in the Northern Hemisphere, PSC compositions were more complex; STS events were found and sometimes one PSC event involved multi-compositions. In both Hemispheres, Liquid Ternary Solution (LTS) were observed in warm area as background sulfur-rich aerosols as expected.

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