



## **Detection of large HNO<sub>3</sub>-containing PSC particles involved in denitrification by infrared limb sounding**

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HNO<sub>3</sub>-containing particles with sizes of several microns in polar stratospheric clouds (PSCs) are known to denitrify the polar winter stratosphere. Observations of these particles are, however, limited to a few field observations, as these particles are low in number density and difficult to detect. Previous studies involving satellite-borne observations by the Michelson Interferometer for Passive Atmospheric Sounding (MIPAS) successfully identified nitric acid trihydrate (NAT) particles with radii smaller  $\sim 3 \mu\text{m}$  in high volume densities. However, the spectral signature around  $820 \text{ cm}^{-1}$  used for identification of spherical NAT particles flattens out at larger particle sizes. Based on a case study indicating that larger NAT particles are highly aspherical and exhibit a characteristic spectral signature, we assess capabilities of infrared limb observations to detect such particles by means of colour ratios. Application of our approach to MIPAS observations during the Arctic winter 2011/2012 suggests that a detection is possible. Detected populations of the particles are compared to gas-phase HNO<sub>3</sub> observations by the Microwave Limb Sounder (MLS).