

Upper Tropospheric Ammonia Detected from AIRS

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This study provides evidence of substantial increases in atmospheric ammonia (NH₃) concentrations (14-year) over several of the world's major agricultural regions, using recently available retrievals from the Atmospheric Infrared Sounder (AIRS) aboard NASA's Aqua satellite. The main sources of atmospheric NH₃ are farming and animal husbandry involving reactive nitrogen ultimately derived from fertilizer use; rates of emission are also sensitive to climate change. It is difficult to retrieve geophysical properties of a thin layer of a constituent (e.g., UT NH₃) above strong sources near the earth's surface from a nadir-view sensor and in the thermal spectral regions. We have developed a technique to obtain such a product with good accuracy. We will show strong UT NH₃ signals over Asian summer monsoon regions that are comparable to those observed by MIPAS (Höpfner et al., 2016). We will also show UT NH₃ signals due to biomass burning emissions.

Key words: Ammonia, Upper Troposphere, AIRS

References

Höpfner, M., Volkamer, R., Grabowski, U., Grutter, M., Orphal, J., Stiller, G., von Clarmann, T., and Wetzell, G.: First detection of ammonia (NH₃) in the Asian summer monsoon upper troposphere, *Atmos. Chem. Phys.*, 16, 14357-14369, <https://doi.org/10.5194/acp-16-14357-2016>, 2016.