Geophysical Research Abstracts
Vol. 20, EGU2018-12929-1, 2018
EGU General Assembly 2018
© Author(s) 2018. CC Attribution 4.0 license.

Ammonia agricultural emissions over Europe as seen by IASI and impact on PM2.5 concentrations

Audrey Fortems-Cheiney (1), Gaelle Dufour (1), Matthias Beekmann (1), Sophie Genermont (2), Frederik Meleux (3), Cathy Clerbaux (4), Pierre-Francois Coheur (5), Martin van Damme (5), and Lieven Clarisse (5)

(1) LISA UMR7583, Creteil, France (audrey.cheiney@lisa.u-pec.fr), (2) INRA/AgroParisTech, Paris, France, (3) INERIS, Verneuil en Halatte, France, (4) LATMOS UMR8190, Paris, France, (5) ULB, Brussells, Belgium

Ammonia (NH3), whose main source is agriculture, is an important gaseous precursor of atmospheric particulate matter (PM). However, NH3 is the most poorly understood pollutant regulated by EU directives for air quality, as flux quantification is highly uncertain and measurement of this compound at the surface of the earth is difficult. Here, we derived daily European ammonia emissions using NH3 total columns from the Infrared Atmospheric Sounding Interferometer (IASI) onboard Metop-A, at a relatively high spatial resolution (grid-cell of 0.5° x 0.5°) for the two years 2010 and 2011. This update of NH3, in magnitude with a relatively high spatio-temporal variability, allows for a better comparison with independent PM2.5 measurements. It shows a different seasonal cycle in 2011 with a strong peak in March 2011, rather than in April in the EMEP prior inventory. It also reveals a peak in August 2011, not described in the EMEP inventory.

This preliminary study suggests that there are good promises for better quantifying NH3 emissions by atmospheric inversions, and particularly with the the 4D Bayesian variational inverse system PYVAR-CHIMERE -based on the adjoint model of CHIMERE- being adapted to NH3.