



New insights on sources and distributions of reactive nitrogen revealed from the global monitoring of atmospheric ammonia

Pierre-Francois Coheur (1), Martin Van Damme (1), Yasmine Ngadi (1), Simon Whitburn (1), Lieven Clarisse (1), Cathy Clerbaux (2), Jan Willem Erisman (3), Enrico Dammers (3), Martijn Schaap (4), Roy Wichink Kruit (4), Han Dolman (3), Pieter Valks (5), Diego Loyola (5), Stefan Reis (6), and Mark Sutton (6)

(1) Spectroscopie de l' Atmosphère, Chimie Quantique et Photophysique, Université Libre de Bruxelles (U.L.B.), Brussels, Belgium, (2) UPMC Univ. Paris 06; Université Versailles St-Quentin; CNRS/INSU, LATMOS-IPSL, Paris, France, (3) Faculteit der aard- en levenswetenschappen (cluster aarde en klimaat), Vrije Universiteit Amsterdam, The Netherlands, (4) TNO, The Netherlands, (5) German Aerospace Center (DLR), Oberpfaffenhofen, Germany, (6) Centre for Ecology & Hydrology (CEH), UK

NH₃ and NO_x account together for close to 90 % of the reactive nitrogen (Nr) input into the atmosphere. Emissions have been strongly increasing since preindustrial times, leading to a cascade of direct or indirect environmental impacts. While global satellite measurements of NO₂ are available since two decades and have largely contributed to a better knowledge of anthropogenic pollution sources and of atmospheric transport and chemistry, this was not the case until recently for NH₃. In this presentation we will shortly review the improved methodology for retrieving NH₃ globally and daily from IASI observations and show first validation results. We will describe the first 6-years of global NH₃ measurements from IASI and discuss the distributions with emphasis on NH₃ source apportionment and the variability in concentrations on various spatial scales, both seasonal and interannual. We will further examine the complementarity of simultaneous NH₃ and NO₂ satellite measurements (from IASI and GOME-2), possibly complemented by those of nitric acid (HNO₃), to bring additional insight into the partitioning of reactive nitrogen sources and their relations in atmospheric processes. The presentation will briefly expose current limitations in the monitoring of Nr species from satellites and perspectives for possible improvements.