



Nocturnal chemistry of iodine and nitrogen oxides – results from the iNOCHES campaign

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Recent field observations have led to suggestions that nitrogen oxide processes, and particularly the formation of IONO_2 , are critical to the nocturnal fate of atmospheric iodine. IONO_2 decomposes on a timescale of several minutes to IO and NO_2 and is an important tropospheric reservoir for iodine, but large uncertainties remain concerning both the rate coefficients of its formation and decomposition, and of its absorption cross-section and photolysis rate. To better constrain these uncertainties, a series of chamber experiments was carried out to investigate these reactions and molecular properties. The iodine-Nitrogen Oxides CHamber ExperimentS (iNOCHES) campaign involved groups from Bayreuth, Cork, and Heidelberg and early results from the campaign are presented here. Instrumentation included an unusually high number of broadband optical cavity spectrometers, providing direct measurements of NO_2 , IO, OIO, I₂, NO_3 , and IONO_2 in the near-UV, blue, green, and red spectral regions. Most reactions were carried out under dark conditions and at different temperatures. Because different reaction pathways dominate in the absence of light, the iNOCHES study complements other investigations of some of the same reactions via photolytically-initiated chemistry.