



## **IASI observations of tropospheric ozone at the regional scale of megacities**

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We present tropospheric ozone observations obtained from infrared radiances measured by the IASI instrument aboard the low-orbit MetOp-A satellite. IASI observations over several megacities in the world, in particular in China (over the Beijing, Shanghai, and Hongkong regions), have been analysed, demonstrating the capability of space-borne infrared nadir measurements to probe both seasonal and daily variations of lower tropospheric ozone at the regional scale. For example, the monthly variations of lower tropospheric ozone retrieved from IASI over China clearly show the influence of the Asian summer monsoon over Chinese megacities. The IASI instrument provides also the opportunity to follow the spatial variations of ozone over each megacity on a daily basis. The detailed analysis of the retrieved ozone profiles leads to the formulation of realistic hypotheses on the origin of the large ozone amounts observed. We show that the large lower tropospheric ozone amounts observed with IASI are generally correlated with the highest population density distribution in each region, thus suggesting the anthropogenic origin of the large ozone amounts observed. In addition, the analysis of the mean daily ozone profiles over each megacity provides evidence of the stratospheric influence on the high ozone amounts observed during winter whereas in spring and summer the tropospheric ozone is more likely enhanced by photochemical production.