Investigating NO$_2$ and HCHO horizontal inhomogeneities using ground-based MAX-DOAS measurements in Mexico City

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MAX-DOAS network in the MCMA

- MAX-DOAS network (Arellano et al., 2016)
- NO$_2$ and HCHO retrieval settings and cross-sections (Hendrick et al., 2016)
- QDOAS software (Danckaert et al., 2017)
- MMF code (Friedrich et al., 2019)
NO$_2$ and HCHO distribution (OMI)

Average 2005-2020 Version 4.0 OMI NO$_2$ Standard Product (OMNO2) (Lamsal et al., 2021)

Average 2005-2020 SAO OMI HCHO (OMHCHO) (González Abad et al., 2015)
NO$_2$ hourly means

ACAT

CUAT

UNAM

VALL
NO$_2$ diurnal cycle

ACAT

UNAM

CUAT

VALL
NO$_2$ seasonal cycle

ACAT

CUAT

UNAM

VALL
NO$_2$ Vallejo station

83-263°

155-335°
NO$_2$ Vallejo station

83-263°

155-335°
HCHO diurnal cycle
HCHO seasonal cycle
HCHO Vallejo station

83-263°

155-335°
**Conclusions**

- Large spatial inhomogeneity of NO$_2$ and HCHO columns in the MCMA (observed as well by satellite-based data)
- Different VCDs are obtained from MAX-DOAS retrievals using data from different viewing directions
- NO$_2$ diurnal cycle characterized by a general increase during the morning hours (ACAT presents large variability)
- HCHO diurnal cycle variable for each station, in general increasing during the day
- Different seasonal cycles identified for NO$_2$ and HCHO
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References


Thank you for your attention...