



*Supplement of*

## **Comparative assessment of TROPOMI and OMI formaldehyde observations and validation against MAX-DOAS network column measurements**

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## Supplementary figures

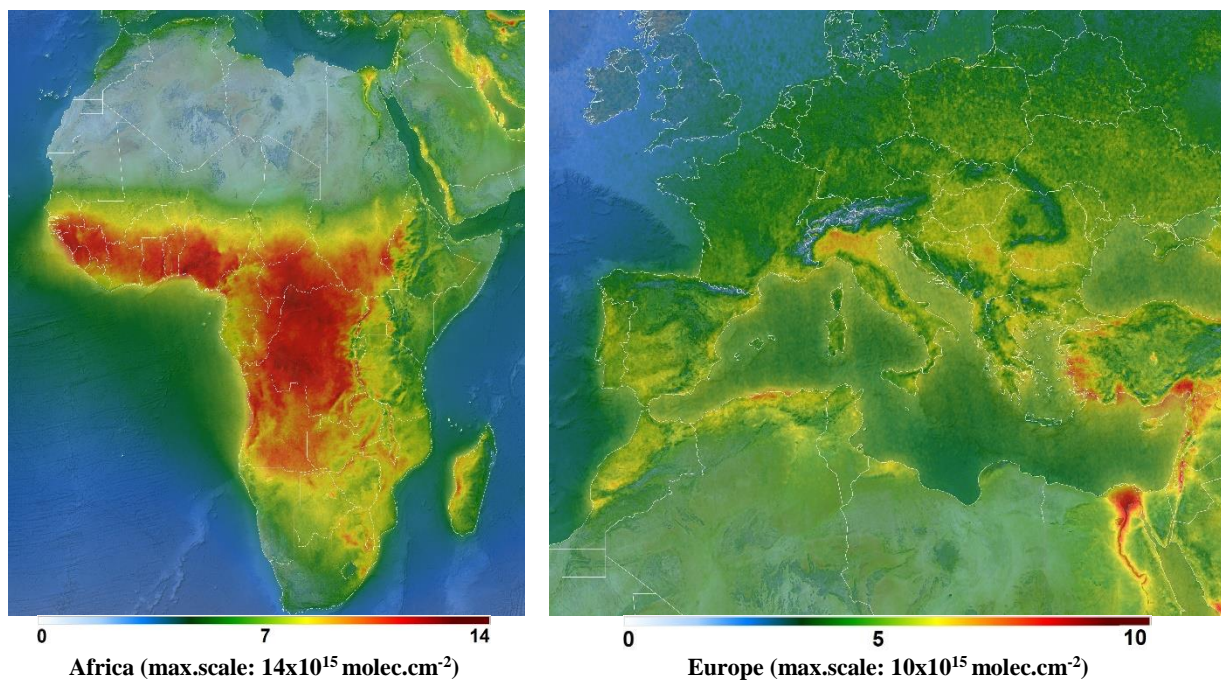
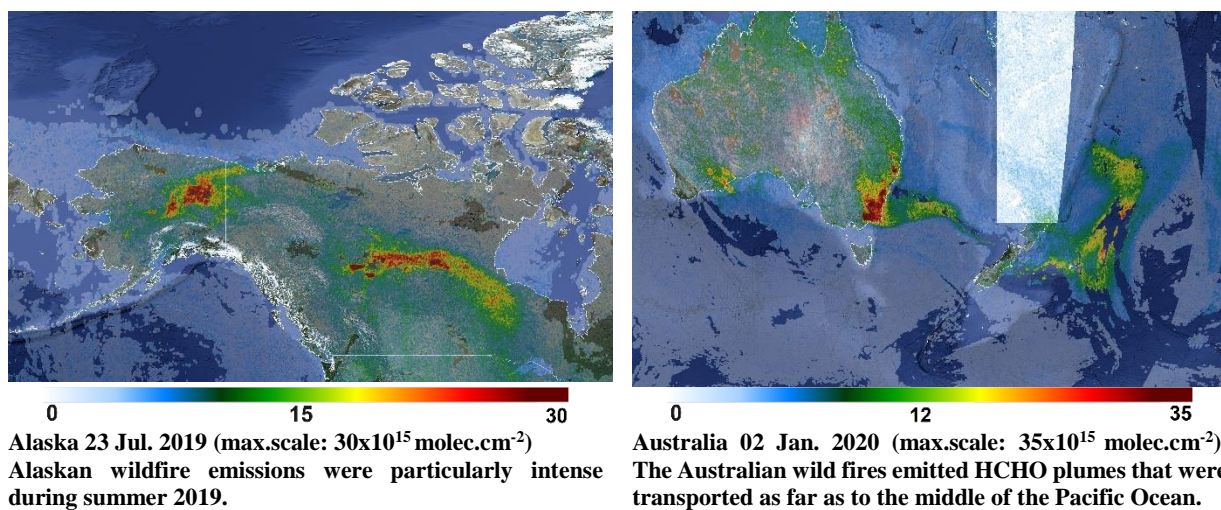
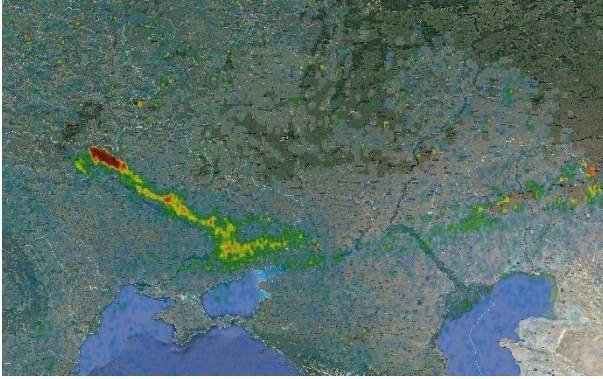
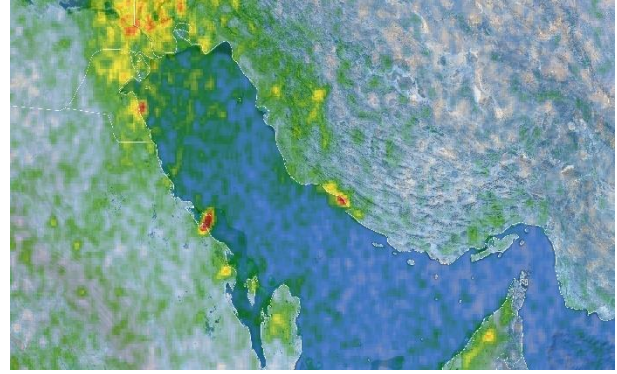


Figure S1: Multi-annual regional maps of TROPOMI HCHO tropospheric columns (March 2018 – February 2021), on a spatial grid of  $0.05^\circ$  in latitude and longitude. Observations are filtered using the provided  $qa\_values > 0.5$ . Modified Copernicus Sentinel-5P satellite data, OFFL L2 HCHO product, BIRA-IASB/DLR/ESA/EU.





Ukraine 17 Apr. 2020 (max.scale:  $30 \times 10^{15}$  molec.cm<sup>-2</sup>). Plume of HCHO caused by an important vegetation fire that occurred near Chernobyl in Ukraine.



Saudi Arabia 28 Aug. 2019 (max.scale:  $35 \times 10^{15}$  molec.cm<sup>-2</sup>). Pollution plume over the port of Jubail, that holds a large petrochemical hub.

Figure S2: Daily observations of TROPOMI HCHO VCD over fire events, on a spatial grid of  $0.05^\circ$  in latitude and longitude. Observations are filtered using the provided qa\_values >0.5. Modified Copernicus Sentinel-5P satellite data, OFFL L2 HCHO product, BIRA-IASB/DLR/ESA/EU.

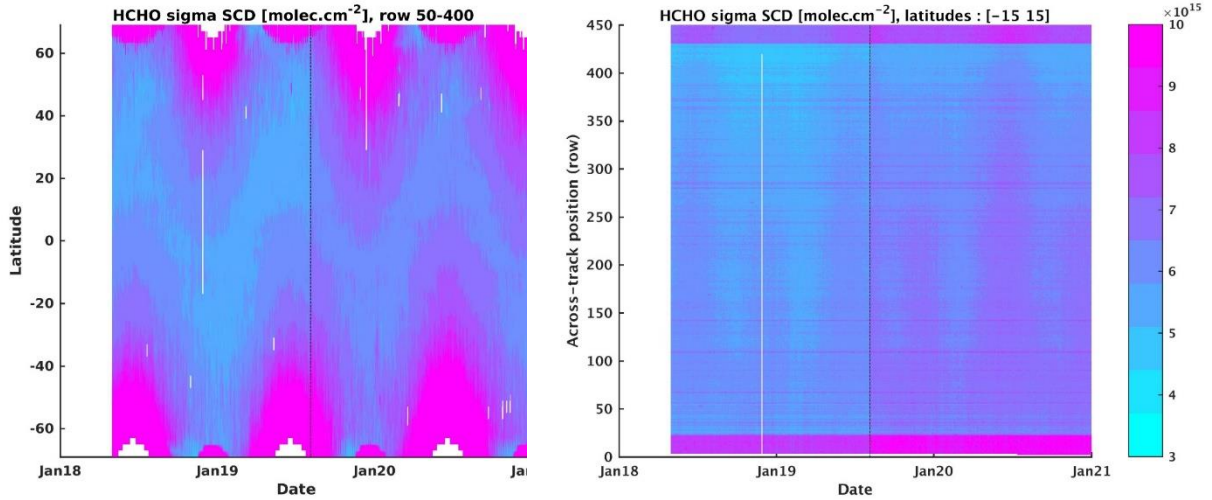
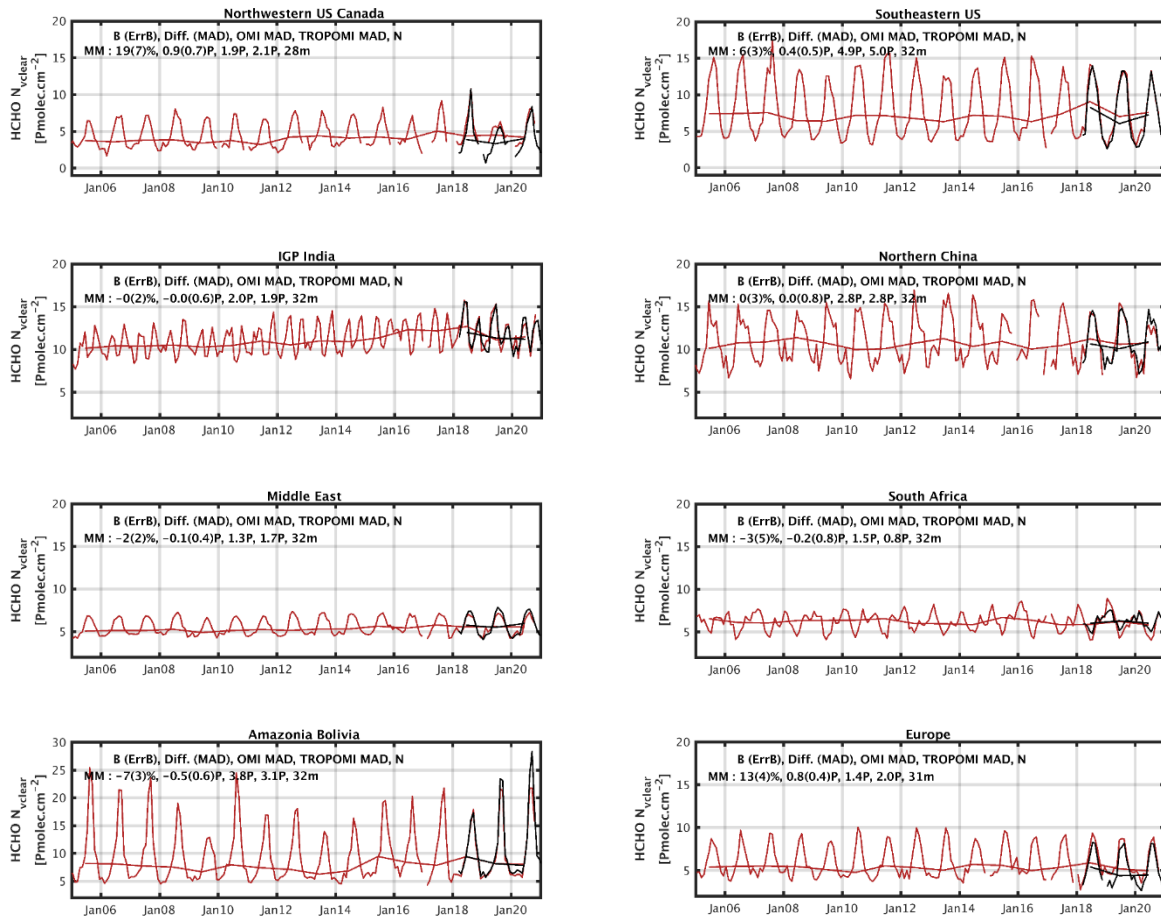


Figure S3: 1-sigma standard deviation of the OFFL TOPOMI HCHO slant columns as a function of the latitude (left column) or the detector row (right column). The step increase on 6th August 2019 reflects the change in the TROPOMI pixel size.





**Figure S4: Monthly and yearly averaged HCHO columns ( $N_{v,clear}$ ) retrieved from OMI (Oct. 2004-Dec. 2020, in red) and TROPOMI (2018-Dec.2020, in black) in a subset of the large regions selected for the comparison. [ $\text{Pmolec.cm}^{-2}=10^{15}$   $\text{molec.cm}^{-2}$ ].**

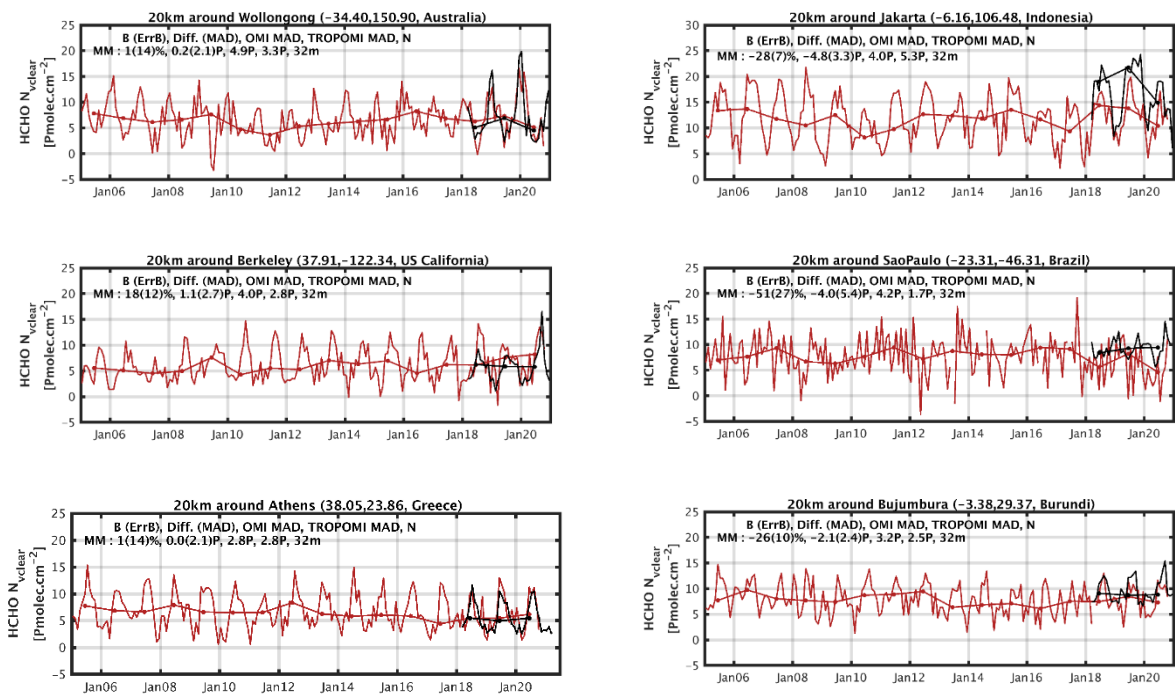


Figure S5: Monthly and yearly averaged HCHO columns ( $N_{v,clear}$ ) retrieved from OMI (Oct. 2004-Dec. 2020, in red) and TROPOMI (2018-Dec. 2020, in black) in a subset of the 20-km areas selected for the comparison. [ $\text{Pmolec.cm}^{-2} = 10^{15} \text{ molec.cm}^{-2}$ ].

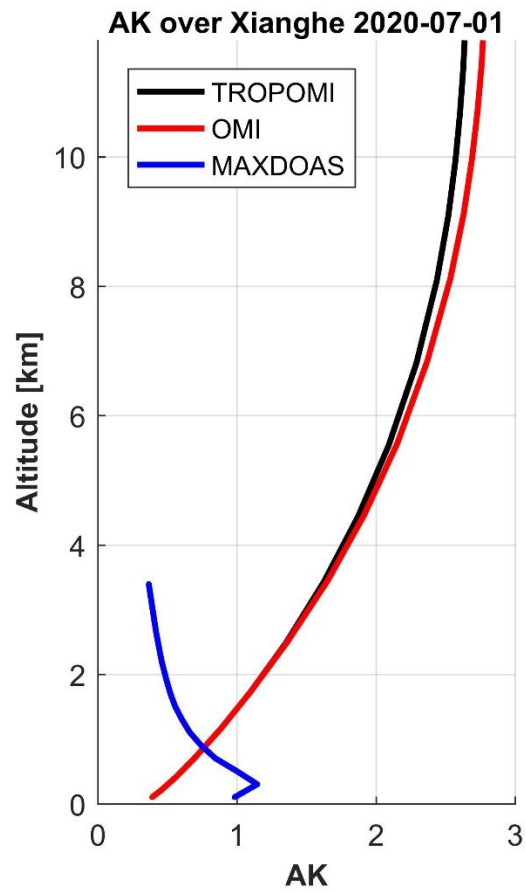


Figure S6: Typical column averaging kernels for TROPOMI, OMI and MAXDOAS instruments on 1 July 2020 over Xianghe.