

Supplemental Materials

Monitoring fossil fuel CO₂ emissions from co-emitted NO₂ observed from space: progress, challenges, and future perspectives

Hui Li^{1,2,#}, Jiabin Qiu^{1,2,#}, Kexin Zhang^{1,2}, Bo Zheng^{1,2*}

¹Shenzhen Key Laboratory of Ecological Remediation and Carbon Sequestration, Institute of Environment and Ecology, Tsinghua Shenzhen International Graduate School, Tsinghua University, Shenzhen, 518055, China.

²State Environmental Protection Key Laboratory of Sources and Control of Air Pollution Complex, Beijing, 100084, China.

[#]These authors contributed equally to this work.

*Corresponding author: Bo Zheng (bozheng@sz.tsinghua.edu.cn)

Table S1. Summary of CO₂ monitoring satellite data sources.

Satellite	Sources
Envisat	https://www.esa.int/Applications/Observing_the_Earth/Envisat https://www.sciamachy.org/ <a href="https://doi.org/10.1175/1520-0469(1999)056<0127:SMOAMM>2.0.CO;2">https://doi.org/10.1175/1520-0469(1999)056<0127:SMOAMM>2.0.CO;2
GOSAT	https://global.jaxa.jp/projects/sat/gosat/ https://ocov2.jpl.nasa.gov/
OCO-2	https://eospso.nasa.gov/missions/orbiting-carbon-observatory-2 https://doi.org/10.5194/amt-16-3173-2023
TanSat	https://fy4.nsmc.org.cn/nsmc/cn/satellite/TanSat.html https://earth.esa.int/eogateway/missions/tansat
GOSAT-2	https://global.jaxa.jp/projects/sat/gosat2/ https://www.gosat-2.nies.go.jp/ https://ocov3.jpl.nasa.gov/
OCO-3	https://eospso.nasa.gov/missions/orbiting-carbon-observatory-3 https://doi.org/10.5194/amt-16-3173-2023

Table S2. Summary of NO₂ monitoring satellite data sources.

Instrument	Sources
GOME	https://www.esa.int/Enabling_Support/Operations/ERS-2 https://www.esa.int/Applications/Observing_the_Earth/Envisat
SCIAMACHY	https://www.sciamachy.org/ <a href="https://doi.org/10.1175/1520-0469(1999)056<0127:SMOAMM>2.0.CO;2">https://doi.org/10.1175/1520-0469(1999)056<0127:SMOAMM>2.0.CO;2
OMI	https://www.earthdata.nasa.gov/sensors/omi https://www.knmiprojects.nl/projects/ozone-monitoring-instrument https://avdc.gsfc.nasa.gov/index.php
GOME-2	https://www.ospo.noaa.gov/Products/atmosphere/gome/gome-A.html https://space.skyrocket.de/doc_sdat/metop.htm
EMI	http://114.116.226.59/chinese/satellite/chinese/gf5 https://doi.org/10.1038/s41377-020-0306-z
TROPOMI	https://www.tropomi.eu/ https://sentiwiki.copernicus.eu/web/s5p-mission
GEMS	https://nesc.nier.go.kr/en/html/cntnts/73/satellite/introduction.do
TEMPO	https://www-air.larc.nasa.gov/missions/tempo/index.html
Sentinel-4/UVN	https://sentinel.esa.int/web/sentinel/missions/sentinel-4