Universität Bremen

IWGGMS 2021

Stefan Noël
stefan.noel@iup.physik.uni-bremen.de

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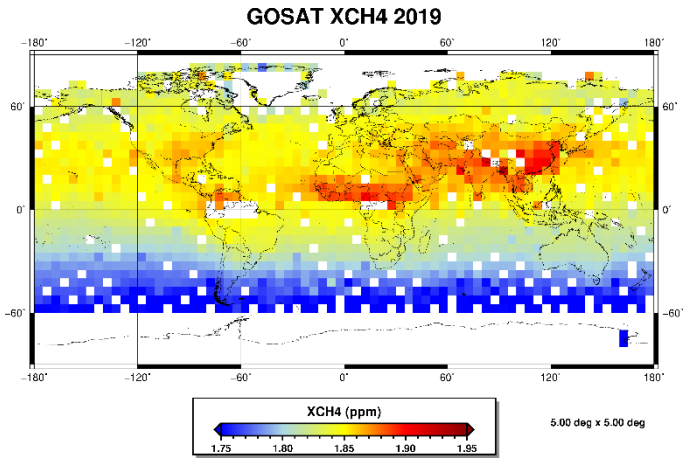
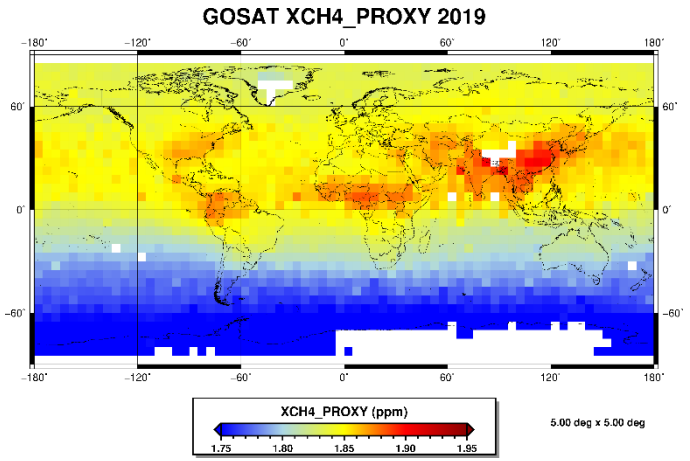
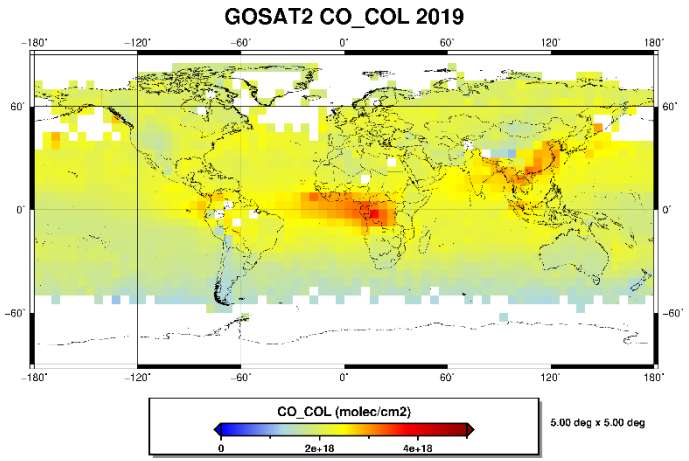
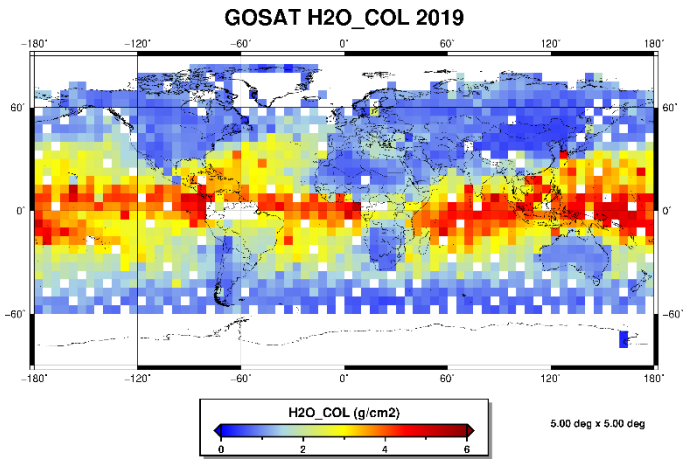
GOSAT and GOSAT-2 FOCAL Retrievals beyond XCO_2

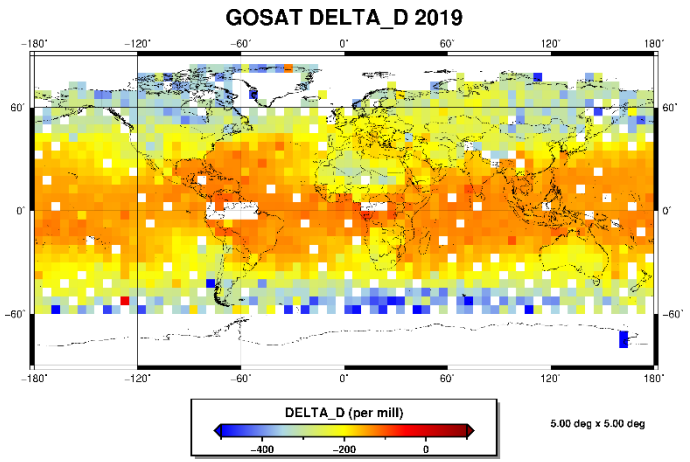
Stefan Noël, Maximilian Reuter, Michael Buchwitz, Oliver Schneising, Jakob Borchardt, Michael Hilker, Heinrich Bovensmann, John P. Burrows











- → Results from updated GOSAT(-2) FOCAL retrievals v2.0
- → Improved filtering, more data
- → XCH_4 (FP & Proxy) for GOSAT-1/2
- → H_2O & HDO (δD) for GOSAT-1/2
- → CO for GOSAT-2
- → Basic algorithm & XCO_2 (v1): see *Noël et al., AMT 2021*

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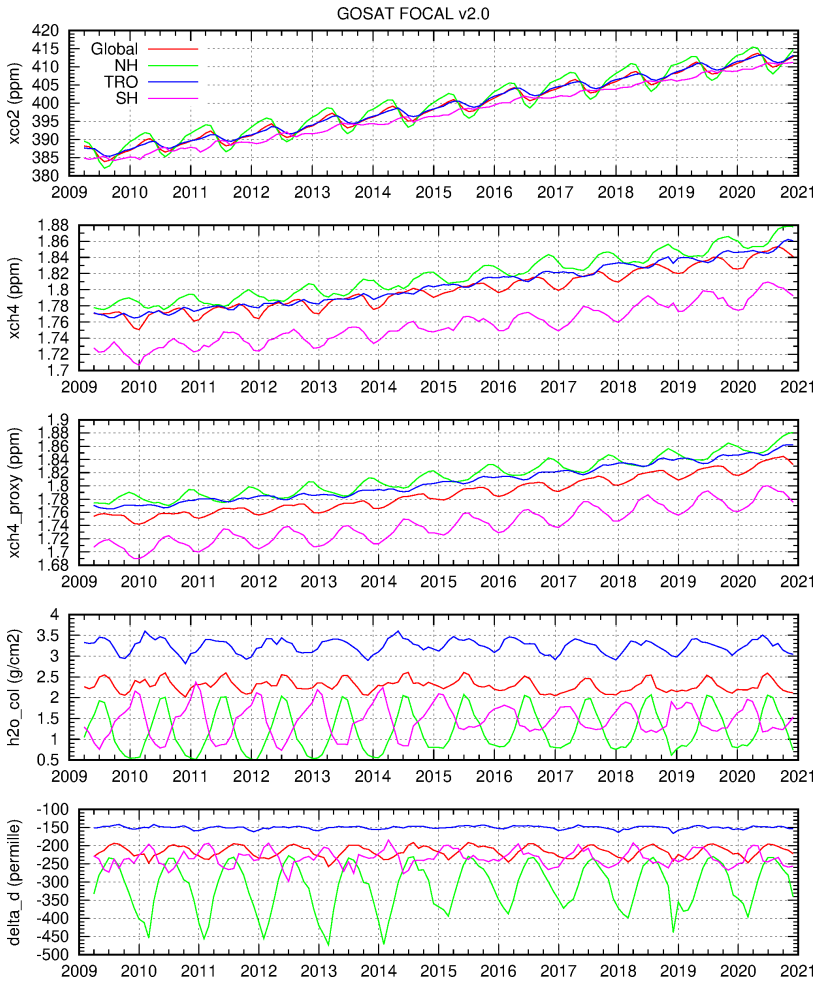
Time Series

→ GOSAT 2009-2020

→ GOSAT-2 2019-2020 (preliminary validation results because of short time series)

→ Plots based on gridded data (5° x 5°)

→GOSAT



CO_2

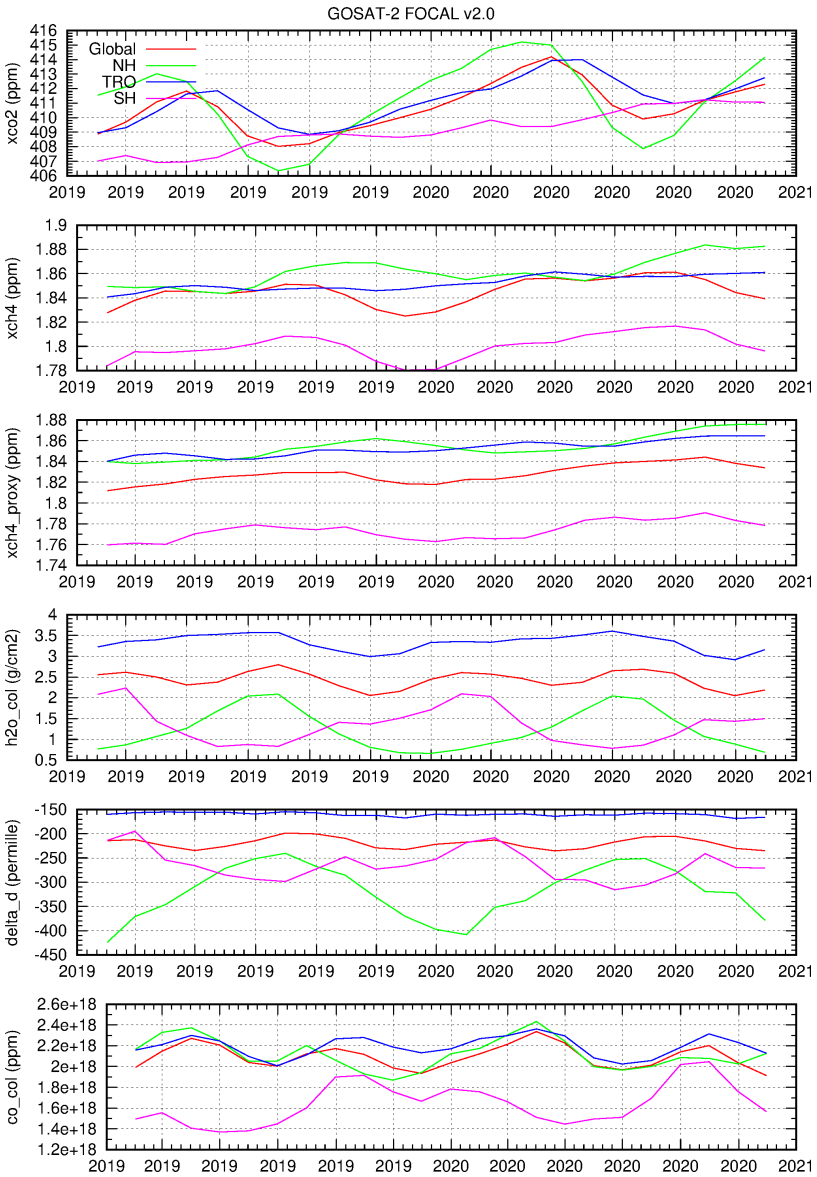
CH_4 FP

CH_4 PR

H_2O

δD

→GOSAT-2



CO

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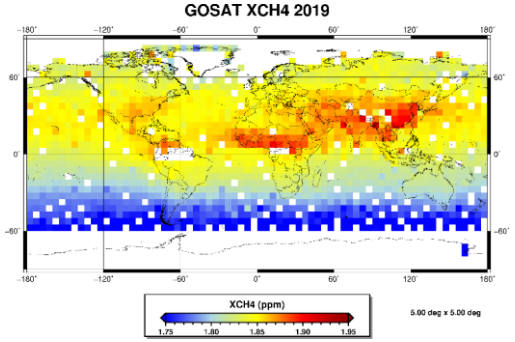
GOSAT Methane (XCH4)

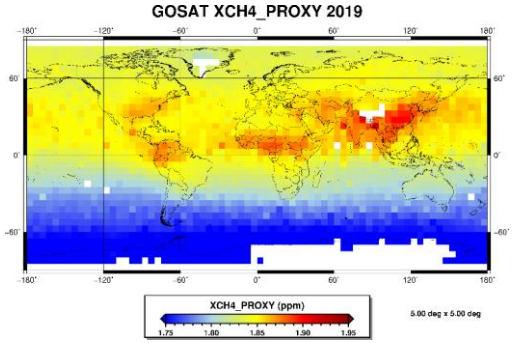
TCCON validation results:

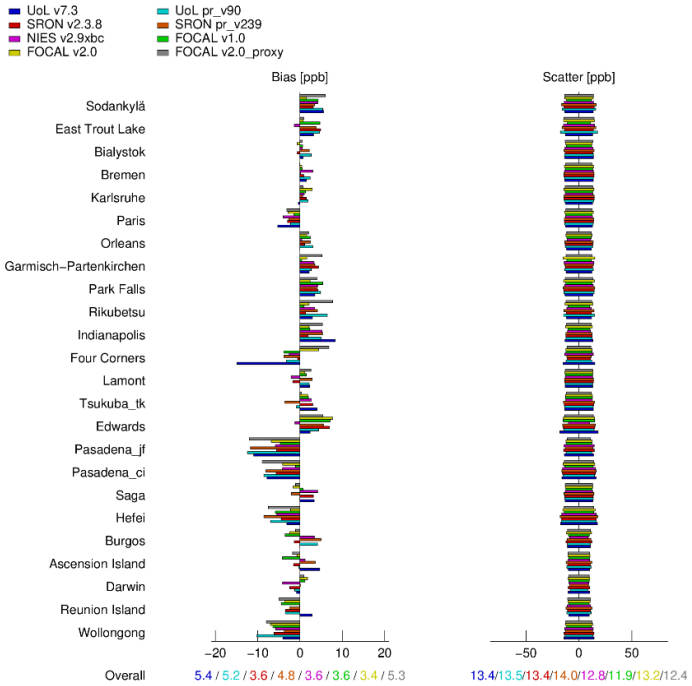
→ XCH_4 bias/scatter 3.4/13.2 ppb (GOSAT)
4.0/13.1 ppb (GOSAT-2)

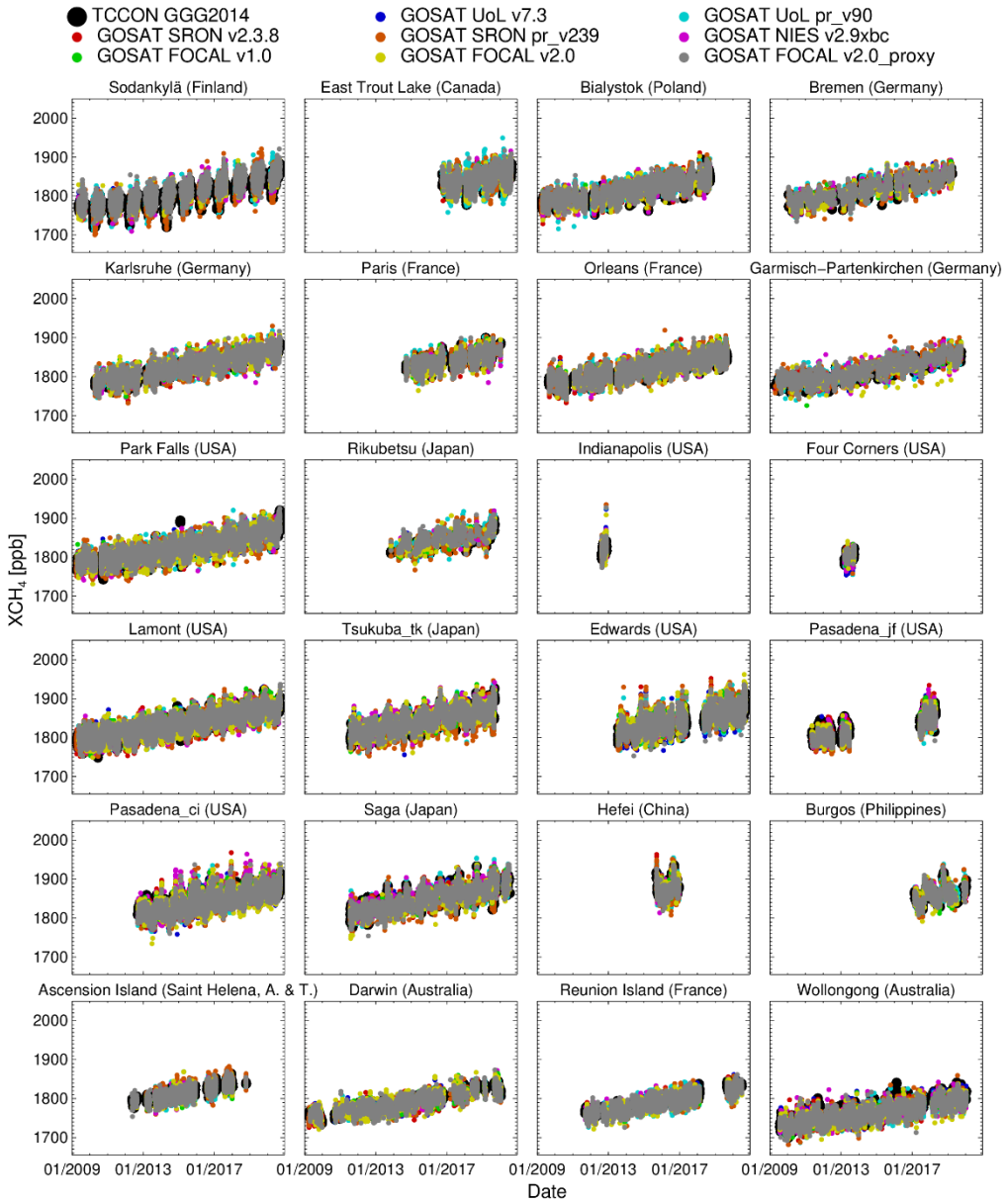
→ XCH_4 proxy bias/scatter 5.3/12.4 ppb (GOSAT)
4.5/11.7 ppb (GOSAT-2)

→ About 2x more data in proxy product









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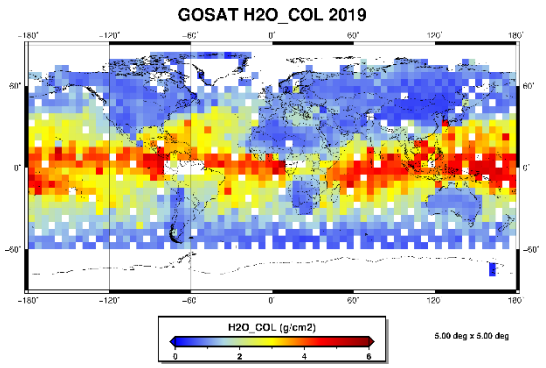
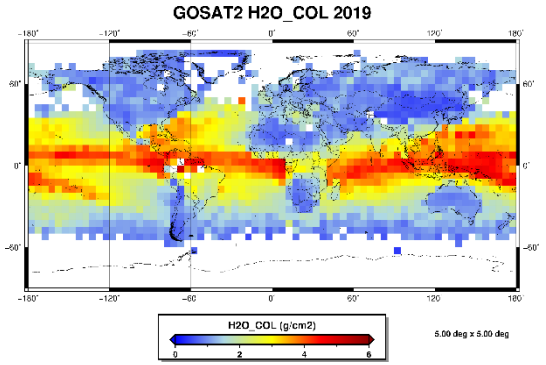
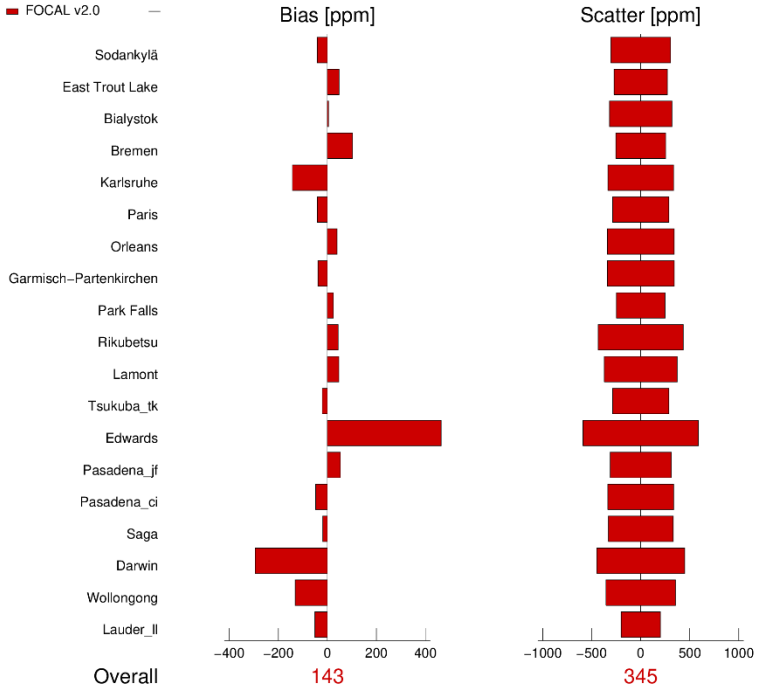
GOSAT Water Vapour

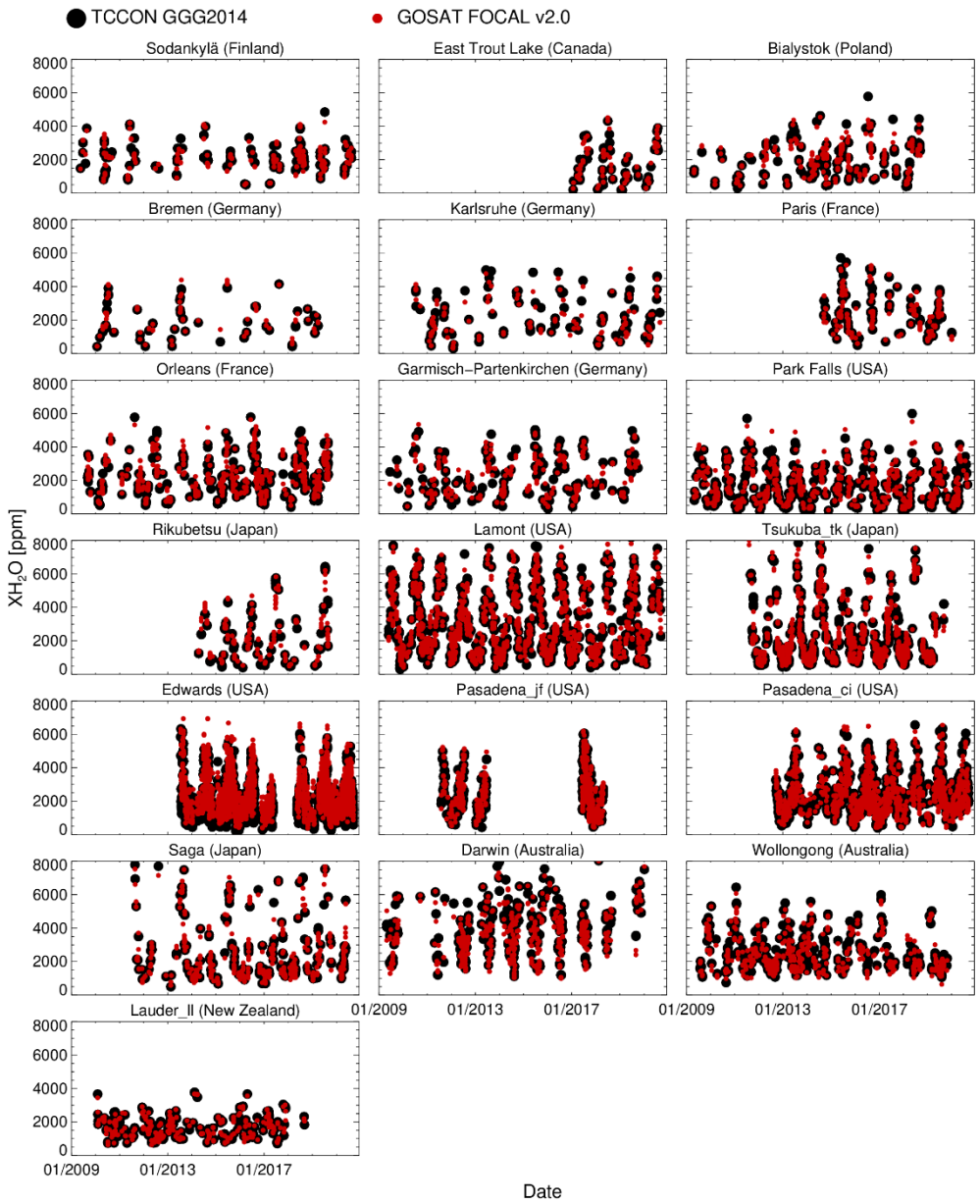
→ TCCON validation: XH2O bias/scatter 143/345 ppm (GOSAT)
218/346 ppm (GOSAT-2)

→ Mean difference to ERA-5 (total columns) ~0.05 g/cm^2









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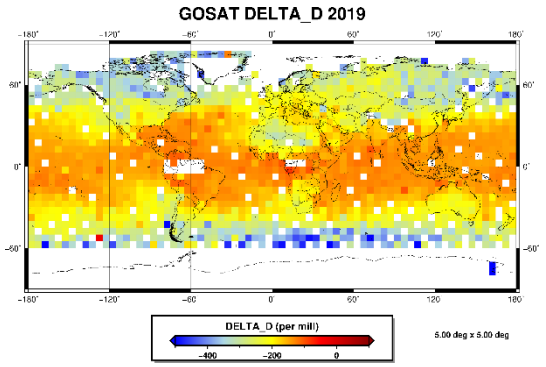
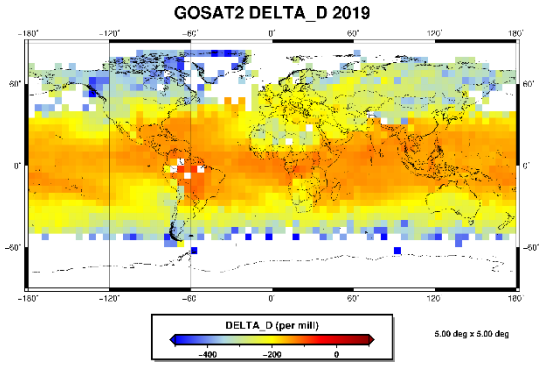
GOSAT HDO (δD)

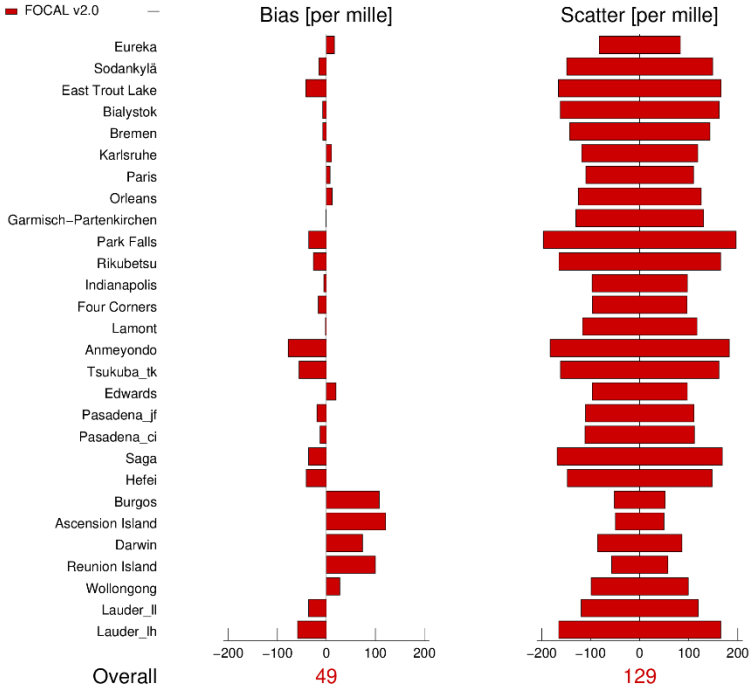
→ δD = 0 per mille -> HDO/H2O as in standard ocean water

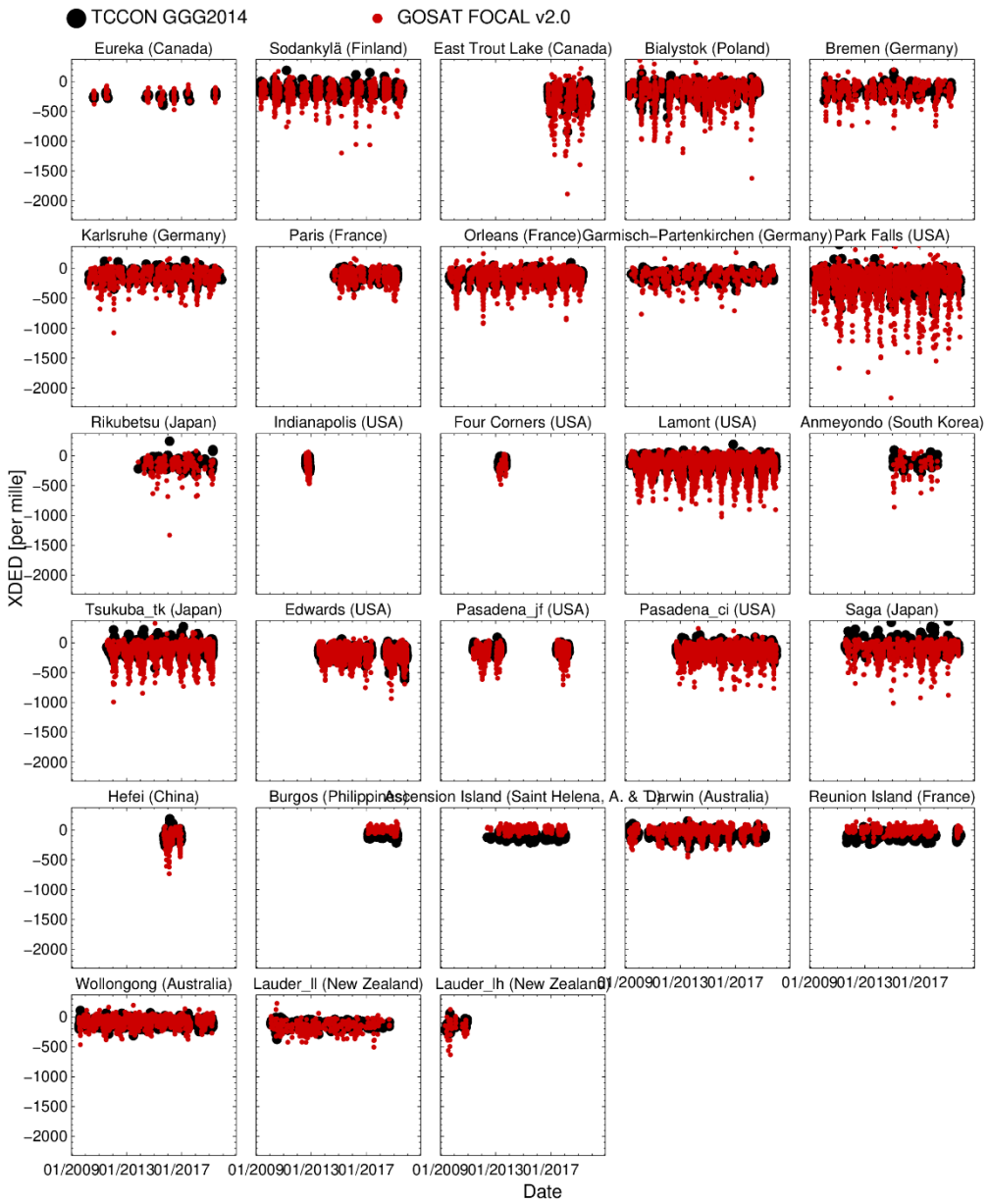
→ δD = -1000 per mille -> no HDO

→ TCCON validation: δD bias/scatter 49/129 (GOSAT)
56/98 (GOSAT-2)









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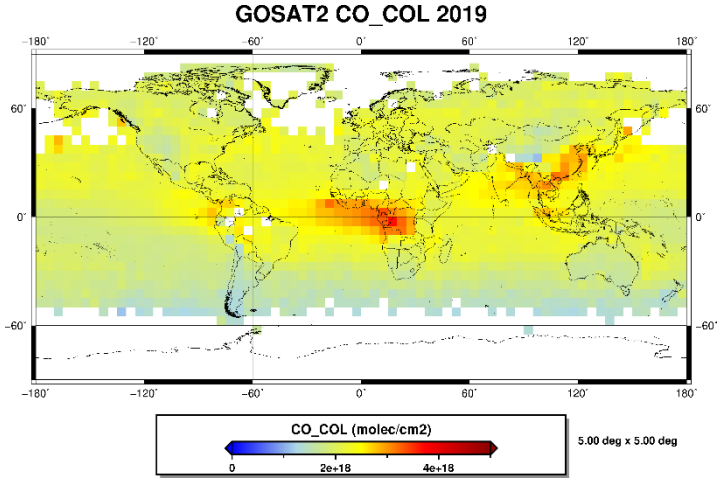
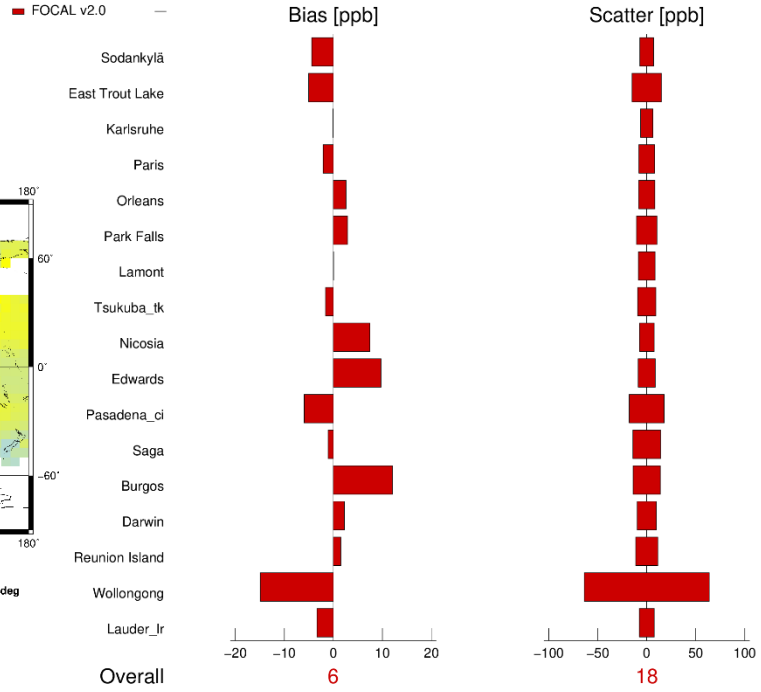
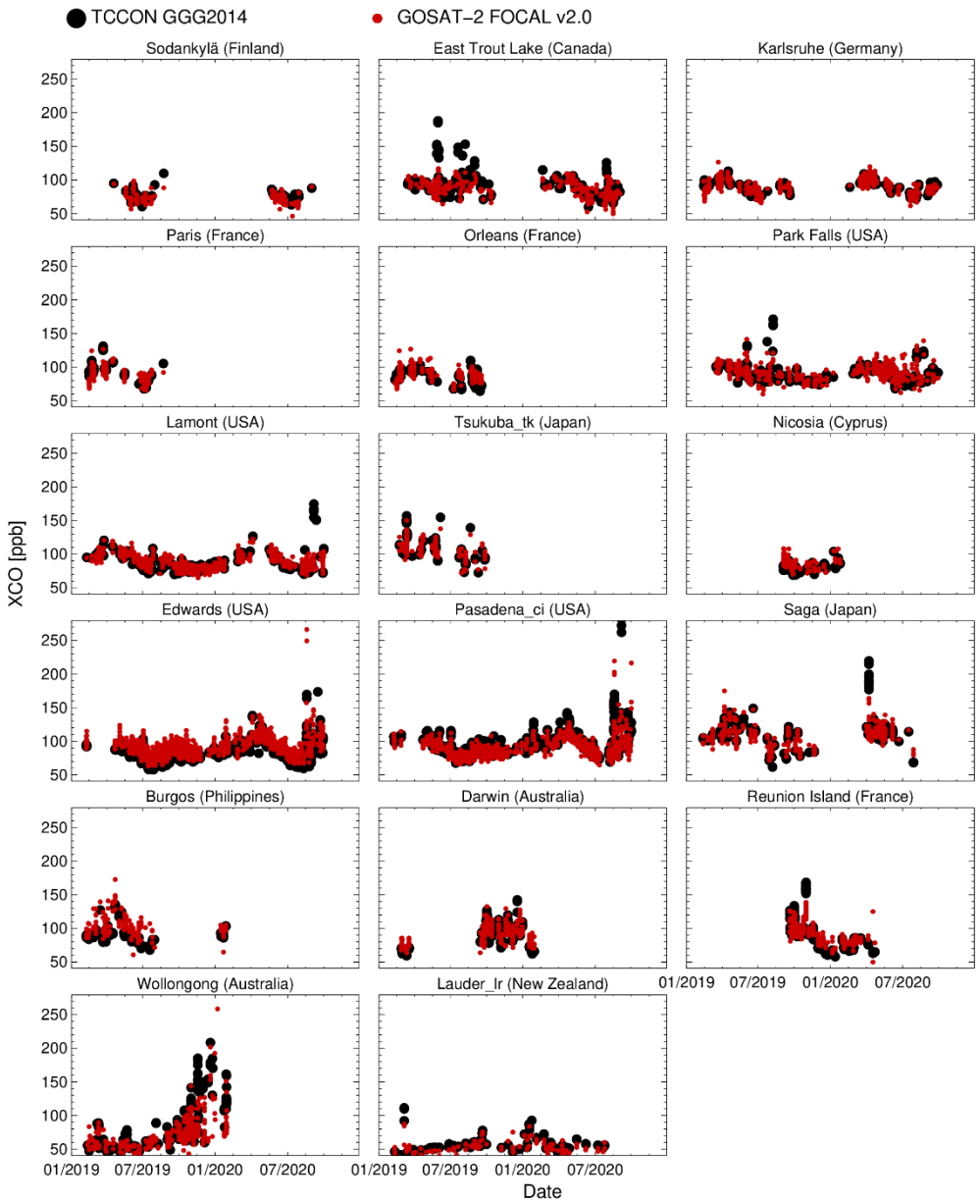
GOSAT-2 Carbon Monoxide

- → Only GOSAT-2
- → Plot: Total Columns – Source regions clearly visible
- → TCCON validation: XCO bias/scatter 6/18 ppb (dominated by Wollongong)