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Operational satellite validation with data from the Pandonia Global Network (PGN)

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Note: views reflected here are of the authors and do not necessarily reflect the views or official policy of the US EPA.



What is the PGN?



- = Pandonia Global Network, https://www.pandonia-global-network.org/
- = Ground-based remote sensing network for air quality monitoring and satellite validation
- = Fiducial Reference Measurement implementation in the scope of satellite validation



Network instrument is the Pandora spectrometer system or short **Pandora**















PGN instrument distribution (May 2020)

NyAlesund

PEARL



Currently in process of giving certificates to make instruments "official" (from red to green in map)





Data processing and management







PGN Real Time Data

http://blickv.pandonia-global-network.org/





click for detail

Current operational products: Total columns NO2 and O3





NO, columns daily upload to EVDC (currently 25 sites)



PGN data distribution in **GEOMS** format through EVDC for **Cal/Val** purposes, e.g. for S5P/ TROPOMI NO2 columns



Produced by S5P MPC Validation Server

Jul 2019

May 2019

Jan 2019

Mar 2019

Nov 2018

May 2018

Jul 2018

Sep 2018

Satellite validation with PGN data



Zhao et al, Assessment of the quality of TROPOMI high-spatial-resolution NO2 data products in the Greater Toronto Area, Atmos. Meas. Tech., 13, 2131–2159, 2020. (left figure, see also presentation at EGU 2020!)

Verhoelst et al, Ground-based validation of the Copernicus Sentinel-5p TROPOMI NO2 measurements with the NDACC ZSL-DOAS, MAX-DOAS and Pandonia global networks, submitted to Atmos. Meas. Tech. (right figure, see also presentation at EGU 2020 "Quality assessment of two years of Sentinel-5p TROPOMI NO₂ data"!)

Pinardi et al, Validation of tropospheric NO2 column measurements of GOME-2 and OMI using MAX-DOAS and direct sun network Observations, submitted to Atmos. Meas. Tech. (see also presentation at EGU 2020 "Validation of tropospheric NO₂ columns measurements from GOME-2, OMI and TROPOMI using MAX-DOAS and direct-sun network observations with focus on dilution effects"!)







Next Goals / Outlook

- Make most instruments official PGN
- Optimize instrument uptime in PGN
- Finish and publish new O3/O3Temp/SO2 product
- Make research products such as NO2 tropospheric columns and surface concentrations as well as HCHO total columns, tropospheric columns and surface concentrations operational

