

Fiducial Reference Measurements for Ground-Based DOAS Air-Quality Observations

FRM₄DOAS

ESA Contract No. 4000118181/16/I-EF – CCN02



Deliverable D17:

NDACC MAXDOAS DOI policy and procedure document

Date: 15/06/2020

Version: 2.0

Contributing authors:

François Hendrick (BIRA-IASB)

Martine De Mazière (BIRA-IASB)

Michel Van Roozendaal (BIRA-IASB)

Andreas Richter (IUP-Bremen)

Thomas Wagner (MPIC)

Udo Frieß (IUP-Heidelberg)

Ankie Pipers (KNMI)

Karin Kreher (BKS)

Alkis Bais (AUTH)

Margarita Yela (INTA)

Cristina Prados-Roman (INTA)

Richard Olav Ruud (NILU)

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1 Introduction

This document describes the data policy and DOI (digital object identifier) approaches that apply to the NDACC MAX-DOAS Service datasets. Both of them are to a large extent based on the revised NDACC data policy and DOI assignment procedure which are under discussion at the level of the Steering Committee (SC) and which should be finalised by Autumn 2020.

2 NDACC MAX-DOAS Service data policy

2.1 General NDACC data policy

The new NDACC data policy is based on the Creative Commons (CC) license system. There are seven types of CC license, from the most open CC0 to the least open CC-BY-NC-ND. These different licenses are briefly described here below (for further details, see <https://creativecommons.org/licenses/>):

- (1) CC0: no rights reserved and data users may freely build upon, enhance and reuse the data for any purposes without restriction under copyright or database law.
- (2) CC-BY: This license lets others distribute, remix, tweak, and build upon licensor data, even commercially, as long as they credit licensor for the original creation.
- (3) CC-BY-SA-4.0: This license lets others remix, tweak, and build upon licensor data even for commercial purposes, as long as they credit licensor and license their new creations under the identical terms.
- (4) CC-BY-NC: This license lets others remix, tweak, and build upon the licensor data non-commercially, and although their new data/works must also acknowledge licensor and be non-commercial, they don't have to license their derivative works on the same terms.
- (5) CC-BY-NC-SA: This license lets others remix, tweak, and build upon licensor data non-commercially, as long as they credit licensor and license their new creations under the identical terms.
- (6) CC-BY-ND: This license lets others reuse the data for any purpose, including commercially; however, it cannot be shared with others in adapted form, and credit must be provided to licensor.
- (7) CC-BY-NC-ND: This license allows others to download licensor data and share them with others as long as they credit licensor, but they can't change them in any way or use them commercially.

As discussed by the NDACC SC and the different Working Groups, instrument principal investigators (PIs) have the choice to select one of the following three types of CC license: CC0 (1), CC-BY-SA-4.0 (3), and CC-BY-NC-SA (5).

2.2 Data policy for the NDACC MAX-DOAS Service

The NDACC MAX-DOAS Service data policy should be considered in the perspective of the Copernicus operational project that will follow the ESA FRM₄DOAS project. Copernicus data license policy is described at:

https://cds.climate.copernicus.eu/api/v2/terms/static/20180314_Copernicus_License_V1.1.pdf

This license is based on the EU regulation n° 377/2014, which stipulates in its Article 7 about Copernicus in-situ component that *“The in situ data shall be used in Copernicus in accordance with applicable third party rights, including those of Member States, and applicable restrictions on use or re-distribution”*. Since the NDACC MAX-DOAS Service data will not be entirely funded by the Copernicus follow-up project (spectra acquisition and MAX-DOAS instruments operation and maintenance are funded by instrument PIs’ own budgets), third party rights and therefore the general NDACC data policy should be in force. This means that the PIs of the instruments that will be part of the NDACC MAX-DOAS Service will have the choice between CC licenses CC0, CC-BY-SA-4.0, and CC-BY-NC-SA. A similar data policy approach is currently in application for the provision of NDACC data to the Copernicus Climate Data Store, as part of the Copernicus C3S project C3S_311a_Lot3 (see <https://climate.copernicus.eu/access-observations-baseline-and-reference-networks>).

Table 1 summarises the type of CC licenses that have been selected by the partners of the project who already submitted spectra files to the Central Processing System (CPS) and who are the primary candidates for the NDACC MAX-DOAS Service KO.

Instrument number	Station name	Affiliation	CC license	DOI
1669	XIANGHE	BIRA-IASB	CC-BY-SA-4.0	https://doi.org/10.21336/35ST-T003
1670	UCCLE	BIRA-IASB	CC-BY-SA-4.0	https://doi.org/10.21336/35ST-T003
1671	HARESTUA	BIRA-IASB	CC-BY-SA-4.0	https://doi.org/10.21336/35ST-T003
1681	LA.REUNION.MAIDO	BIRA-IASB	CC-BY-SA-4.0	https://doi.org/10.21336/35ST-T003
1672	NY.ALESUND	IUP	CC-BY-NC-SA	https://doi.org/10.21336/apdwnb87
1673	BREMEN	IUP	CC-BY-NC-SA	https://doi.org/10.21336/apdwnb87
1674	ATHENS	IUP	CC-BY-NC-SA	https://doi.org/10.21336/apdwnb87
1684	DEBILT	KNMI	CC-BY-SA-4.0	https://doi.org/10.21336/5nz3-t091
1676	MAINZ	MPIC	CC-BY-NC-SA	https://doi.org/10.21336/44rr-pq30
1677	LAUDER	NIWA	CC-BY-SA-4.0	https://doi.org/10.21336/qbcv-0q26

1678	NEUMAYER	UHEIDELBERG	CC-BY-NC-SA	https://doi.org/10.21336/cqgg-4d20
1679	HEIDELBERG	UHEIDELBERG	CC-BY-NC-SA	https://doi.org/10.21336/cqgg-4d20
1683	THESSALONIKI	AUTH	CC-BY-NC-SA	https://doi.org/10.21336/2van-tm26
1698	IZANA	INTA	CC-BY-NC-SA	https://doi.org/10.21336/at8v-5k61

Table 1: List of current stations processed by the CPS and corresponding CC license choice. The table also contains the different institutions' DOIs (see Sect. 3.2).

The selected license will be reported in the NDACC MAX-DOAS Service GEOMS files, in the global dataset attribute 'DATA_RULES_OF_USE'.

3 NDACC MAX-DOAS Service DOI

3.1 Definitions

A DOI is a persistent identifier or handle used to identify objects uniquely, based on ISO (International Organization for Standardization) standards. As illustrated in Figure 1, it is composed of a prefix which corresponds to the registrant identifier and a suffix which describes the object associated with the DOI. A DOI must refer to a landing page where the data can be found (i.e., to a data repository) or an URL that contains a link to the data repository or to a contact address to request the data. The DOI landing page or URL, which should exist for at least 10 years, must contain the following metadata information about the dataset:

- Title, Author(s), Publisher, Publication year, Language, Version
- Keywords, Resource type (here 'Dataset'), Size, Format (here GEOMS), Funder(s), GeoLocation, and License (e.g. 'CC0')

An example of landing page (FRM4GHG datasets) can be found at <http://frm4ghg.aeronomie.be/index.php/outreach/datasetlevel2doi>. Further details about DOI can be found at <https://www.doi.org/hb.html>.

<https://doi.org/10.14291/tccon.ggg2014.reunion01.r1>

Prefix: registrant of the identifier (here CalTech)

Suffix: object associated with the DOI (here TCCON data from Reunion Island, processor ggg2014, data version r1)

Figure 1: Example of DOI structure (TCCON dataset at Reunion Island)

3.2 DOI for NDACC MAX-DOAS Service datasets

Since the datasets generated by the NDACC MAX-DOAS Service will be catalogued on the NDACC 'RD' and/or 'CONSOLIDATED' repositories with mirror copy on the EVDC database, the Norwegian Institute for Air research (NILU), which hosts EVDC and is the registration agency appointed by NDACC, has assigned DOIs for all the stations that will be part of the NDACC MAX-DOAS Service Kick-off (see Table 1). The assigned DOI are reported in the GEOMS data files through the global data file attribute 'FILE_DOI', ensuring the traceability of the data sets.

One important aspect of DOIs is their granularity. The baseline approach for the NDACC MAX-DOAS Service is to have, as a start, one DOI per institute. If needed, it will be possible to revise the DOI granularity in the future, e.g. assigning one DOI to the ensemble of stations providing a given product (e.g. NDACC MAX-DOAS lower tropospheric NO₂ profile data). It should be noted that multiple DOIs assignment is also feasible.