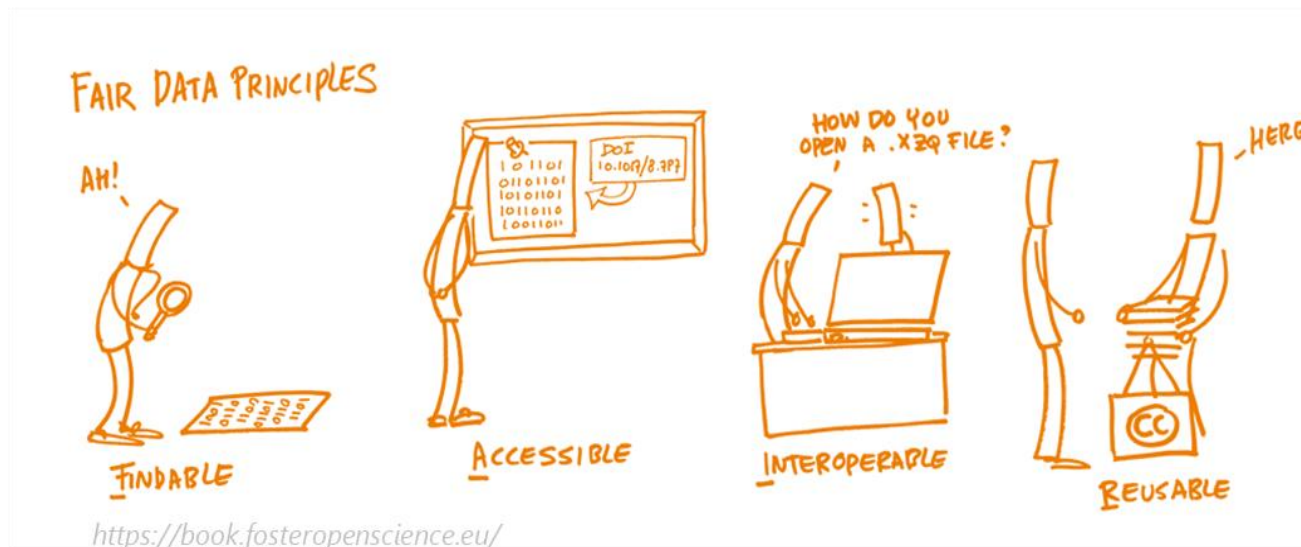


Application of FAIR data principles on the EPN Historical Data Center

A. Miglio, C. Bruyninx, A. Fabian, J. Legrand



Royal Observatory of Belgium



Introduction

Royal Observatory of Belgium has been looking into ways to apply the FAIR data principles on GNSS data since a couple of years

In collaboration with the data stewards of the University of Ghent

to enable and enhance the reuse of data by both humans and machines.

Experiences shared during splinter meetings:

- EUREF 2021 symposium, May 27, 2021
- EUREF 2022 symposium, June 2, 2022

This presentation: show results of the implementation of FAIR data principles applied on the EPN Historical Data Center

EUREF 2021

Resolution No. 2.

The IAG Reference Frame Sub-commission for Europe (EUREF)

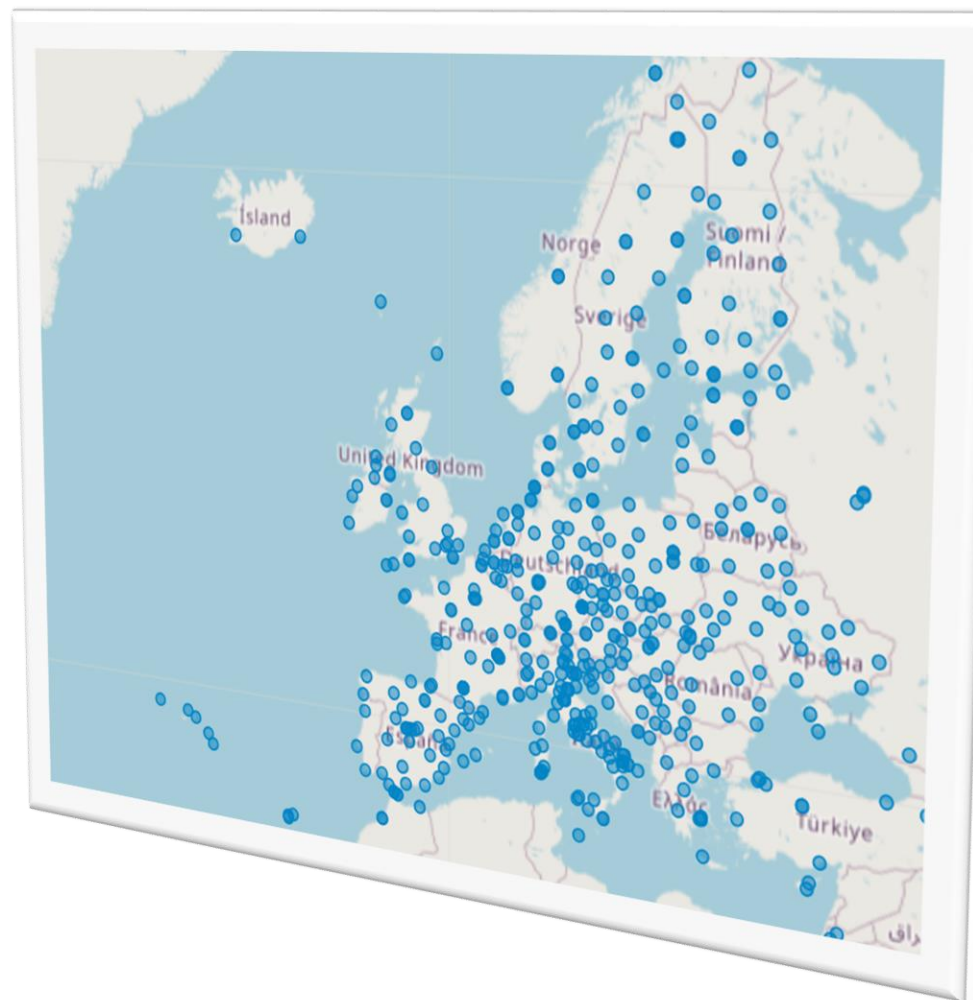
considering that major funding bodies, including the European Commission, promote and require the implementation of FAIR (Findable, Accessible, Interoperable, and Reusable) data principles

and recognising that FAIR data principles increase the value and the reuse of digital resources, by humans as well as machines

encourages the EUREF community to adopt these principles in all aspects of data management

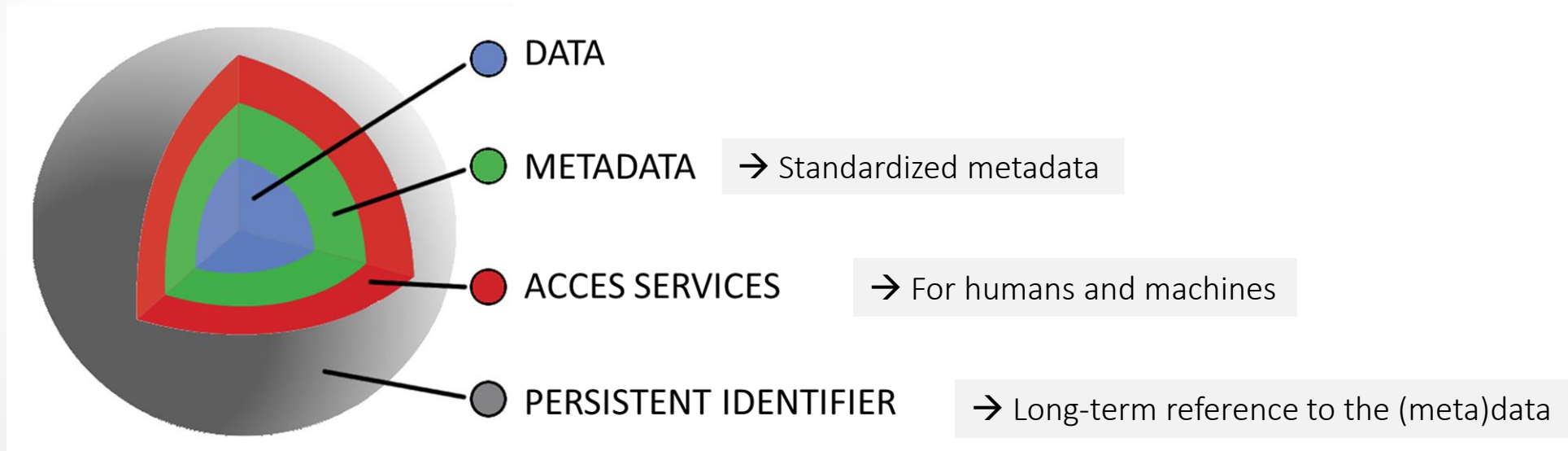
EPN Historical Data Center (HDC)

- Archive of daily RINEX data from EPN stations – to be as complete as possible
- Actively looking for data of EPN stations
 - from before station was included in EPN
 - not available from regional EPN data centers
- 500+ GNSS stations
- 2,5+ million RINEX files
- <https://epncb.oma.be/pub/RINEX>



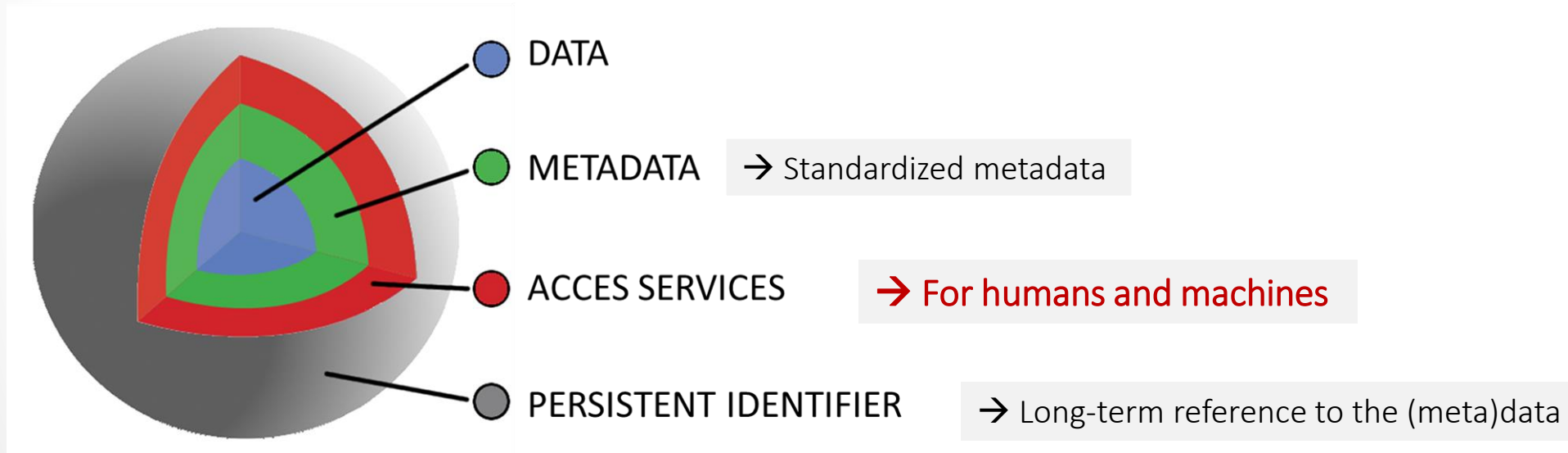
Implementation of FAIR data principles

CREATION OF FAIR DIGITAL OBJECTS (FDO)



Implementation of FAIR data principles

CREATION OF FAIR DIGITAL OBJECTS (FDO)



New data portal providing access to GNSS data in historical EPN data center

Beta version!

<https://gnss.be/opendataportal/>

The screenshot shows the 'EPN GNSS data repository' search form on the GNSS.be (Beta) website. The page header includes the GNSS.be logo, navigation links (Home, About Us, Activities, Open Data Portal, More Information), and the Royal Observatory of Belgium logo. The breadcrumb trail is 'HOME > OPEN DATA PORTAL > EPN HDC DATA'. The main heading is 'EPN GNSS data repository'. Below this, a description states: 'The form below allows you to enter some search criteria, browse through the EPN Historical GNSS data repository and find RINEX data files corresponding to your search.' To the right of the description are buttons for 'Direct access to: API, File Server, Metadata File Server, and a help icon'. The search form itself is titled 'SEARCH FORM' and contains four sections: 'SELECT LOCATION' with input fields for Latitude (min), Latitude (max) (set to 9), Longitude (min), and Longitude (max) (set to 11); 'SELECT RINEX VERSION' with radio buttons for RINEX 2, RINEX 3, RINEX 4, and 'All' (selected); 'SELECT DATE RANGE' with 'From' (1996-01-01) and 'To' (2024-05-30) fields, and a note 'Based on first and last RINEX file observed by the stations'; and 'SELECT STATION' with a text input for 'Stations' 9-char ID list and a note '9-char IDs separated by commas, e.g. ACOR00ESP,ADAR00GBR,AGRN00ITA'. At the bottom, a note states: 'Please note that some stations might appear in the list while no RINEX data are available in the selected date range. For more reliable results based on the repositories' database and using pagination, please access the [Advanced search](#) page.' There are 'Cancel' and 'Submit' buttons at the bottom right.

GNSS.be (Beta)

HOME > OPEN DATA PORTAL > EPN HDC DATA

EPN GNSS data repository

The form below allows you to enter some search criteria, browse through the EPN Historical GNSS data repository and find RINEX data files corresponding to your search.

Direct access to: [API](#) [File Server](#) [Metadata File Server](#) [Help](#)

SEARCH FORM

SELECT LOCATION

Latitude (min) - Latitude (max) 9 Longitude (min) - Longitude (max) 11

SELECT RINEX VERSION

☐ RINEX 2 ☐ RINEX 3 ☐ RINEX 4 ☒ All

SELECT DATE RANGE

From 1996-01-01 To 2024-05-30 Based on first and last RINEX file observed by the stations

SELECT STATION

Stations' 9-char ID list 9-char IDs separated by commas, e.g. ACOR00ESP,ADAR00GBR,AGRN00ITA

Please note that some stations might appear in the list while no RINEX data are available in the selected date range.
For more reliable results based on the repositories' database and using pagination, please access the [Advanced search](#) page.

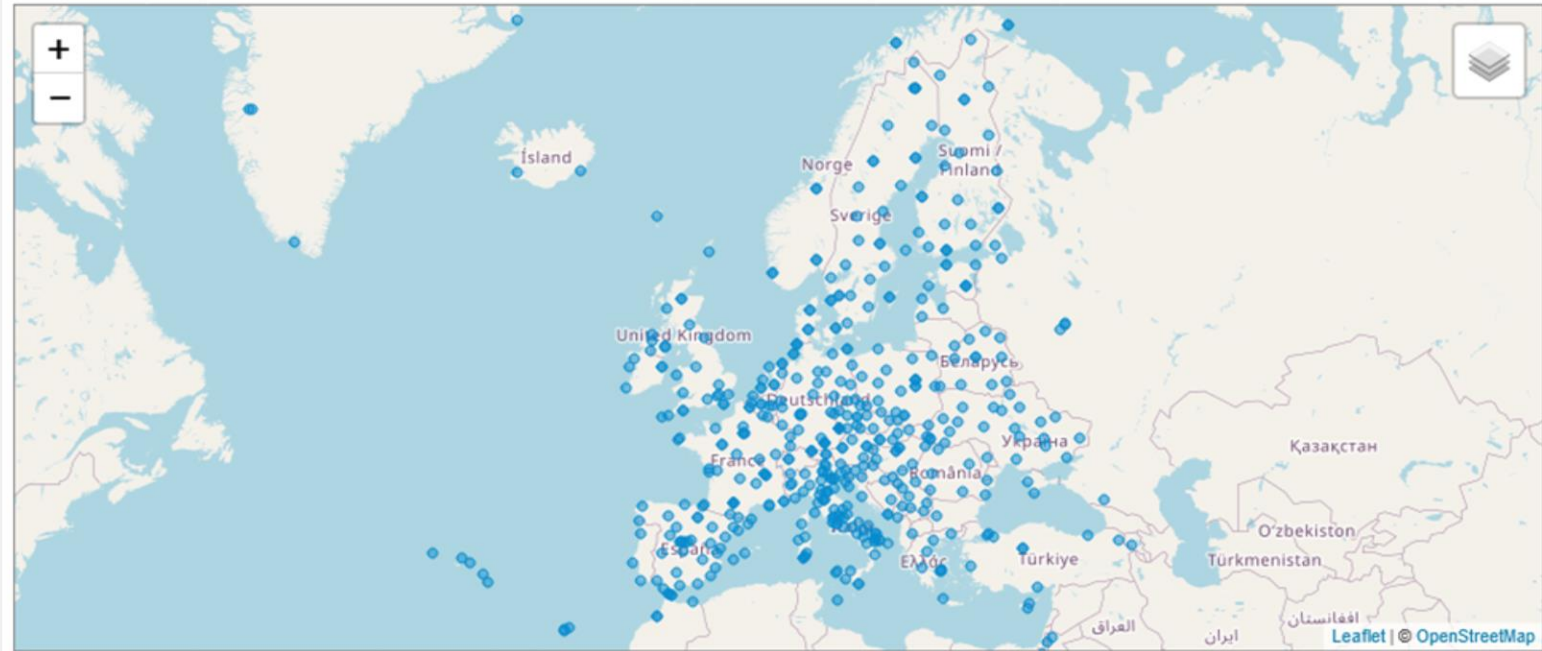
[Cancel](#) [Submit](#)

New data portal providing access to GNSS data in historical EPN data center

Beta version!

<https://gnss.be/opendataportal/>

SEARCH RESULTS



DOWNLOAD SELECTED STATION LIST

Show entries

Search:

STATION					DATA			LINKS TO (META)DATA		
NAME	CITY	COUNTRY	LATITUDE	LONGITUDE	AVAILABILITY	QUALITY	INFO	TXT	JSON	JSON-LD
ACOR00ESP	A Coruna	Spain	43.3644	-8.3989						
ADAR00GBR	Aberdaron	United Kingdom (the)	52.7892	-4.7413						
AGRN00ITA	Agrigento	Italy	37.3033	13.5965						
AJAC00FRA	Ajaccio	France	41.9275	8.7626						

New data portal providing access to GNSS data in historical EPN data center

Beta version!

<https://gnss.be/opendataportal/>



EUREF Permanent GNSS Network



[Home](#) / [Network & Data](#) / [Station List](#) / A Coruna, Spain (ACOR00ESP)

A Coruna, Spain (ACOR00ESP)

ACOR00ESP (A Coruna, Spain)

50

Station Configuration

RESPONSIBLE AGENCY	IGE (Instituto Geografico Nacional de Espana)
RESPONSIBLE FOR METADATA	IGE (Instituto Geografico Nacional de Espana)
CURRENT STATION CONFIGURATION	acor00esp_20240411.log
STATUS IN EPN	included since 05-09-1999
DATA LICENSE	CC-BY-4.0
DIGITAL OBJECT IDENTIFIER (DOI)	https://doi.org/10.24414/ROB-EUREF-ACOR00ESP
LAST AVAILABLE DATA	29-05-2024
LAST RECEIVER	LEICA GR50 (11-04-2024 to now)
SET TO TRACK	GPS+GLO+GAL+BDS
LAST ANTENNA	LEIAT504/LEIS (18-03-2007 to now)
INDIVIDUAL CALIBRATION(S)	none
DATA ROUTINELY ANALYSED BY	BEK , IGE , IGN , ROB
INCLUSION IN OTHER NETWORK(S)	EPOS

Data Provided

Location



Pictures

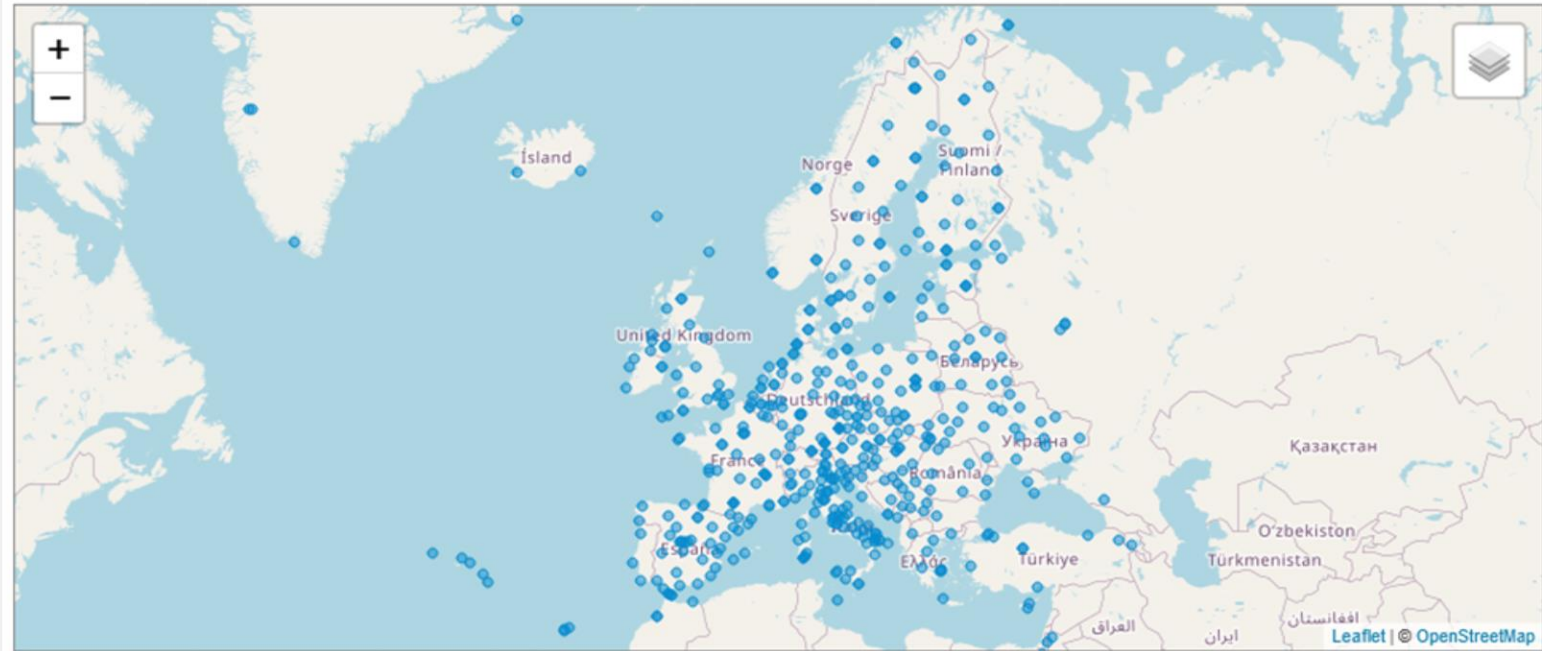


New data portal providing access to GNSS data in historical EPN data center

Beta version!

<https://gnss.be/opendataportal/>

SEARCH RESULTS



DOWNLOAD SELECTED STATION LIST

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Search:

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ACOR00ESP	A Coruna	Spain	43.3644	-8.3989						
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AGRN00ITA	Agrigento	Italy	37.3033	13.5965						
AJAC00FRA	Ajaccio	France	41.9275	8.7626						

Data and Metadata Web Services

DATA REPOSITORY

To access repository metadata

- Publisher, location, [list of GNSS stations with datasets](#), etc.

To access the GNSS data and metadata directly via a RESTful API without need to go through the web portal

STATION DATASET (all daily RINEX data of a station)

To access metadata of station's dataset

- [DOI, data license, station location](#), etc.
- Overview of the [available RINEX data](#)
- + Link to metadata of repository

RINEX FILE

To access RINEX data and metadata

- [URL of the RINEX file](#)
- File size
- Last modified date
- + Link to metadata of Station Dataset

Data and Metadata Web Services - Documentation

<https://gnss.be/api/v1/ept/doc>

RINEX DATA API 0.0.2 OAS 3.0

[swagger/swagger.yaml](#)

Download daily RINEX data and associated metadata from the [EPN Historical Data Center repository](#).

To download daily RINEX (meta)data from the Belgian repository click [here](#).
To know more, visit the [gnss.be Open Data Portal](#) and have a look at its [documentation](#).

Please note that currently the number of API requests per user is limited to 20 per minute.

[gnss.be](#) - Website
[Send email to gnss.be](#)
[Apache 2.0](#)

Servers

<https://gnss.be/api/v1/ept/> - API Server for daily GNSS RINEX data from the EPN Historical Data Center

data Access the daily RINEX data and associated metadata of the EPN HDC repository of the [gnss.be Open Data Portal](#)

GET `/station-data/{stationId}` Retrieve URLs (and associated metadata) of the RINEX data of one GNSS station in a given time range (no pagination)

GET `/data` Retrieve URLs (and associated metadata) of the RINEX data of one or more GNSS stations in a given time range (using pagination)

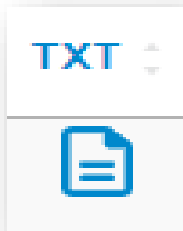
GET `/distribution/{stationid}/{YEAR}/{DOY}/{rinex_version}` Retrieve URL for a single RINEX data file of a given YEAR/DOY/RINEX version and associated metadata for one GNSS station (no pagination)

GET `/doy/{YEAR}/{DOY}` Retrieve RINEX data URLs and associated metadata of one or more GNSS stations for a given YEAR/DOY (no pagination)

GET `/dataset/{stationId}` Retrieve the metadata (DOI, data license, station location, etc. and an overview of the available RINEX data) of a given GNSS station

GET `/catalog` Retrieve metadata (publisher, location, list of GNSS stations, etc.) associated with the EPN HDC repository

Example



RINEX files of ACOR00ESP observed between 1996-01-01 and 2022-12-31 that have been changed after 2023-07-01 ?

Command line

```
curl -X 'GET' 'https://gnss.be/api/v1/ept/station-data/ACOR00ESP  
?rinexVersion=all&startDate=1996-01-01&endDate=2022-12-31&changeDate=2023-07-01' -  
H'accept: text/plain'
```

Output

```
https://epncb.oma.be/pub/RINEX/2021/319/ACOR00ESP\_R\_20213190000\_01D\_30S\_MO.crx.gz  
https://epncb.oma.be/pub/RINEX/2021/320/ACOR00ESP\_R\_20213200000\_01D\_30S\_MO.crx.gz  
https://epncb.oma.be/pub/RINEX/2021/321/ACOR00ESP\_R\_20213210000\_01D\_30S\_MO.crx.gz
```

<https://github.com/ROB-GNSS/gnss.be-data-API-examples>

Example



RINEX files of ACOR00ESP observed between 1996-01-01 and 2022-12-31 that have been changed after 2023-07-01 ?

Command line

```
curl -X 'GET' 'https://gnss.be/api/v1/ept/station-data/ACOR00ESP  
?rinexVersion=all&startDate=1996-01-01&endDate=2022-12-31&changeDate=2023-07-01' -  
H'accept: application/ld+json'
```

Output ?

Example

JSON-LD



RINEX files of ACOR00ESP
2023-07-01 ?

Command line

```
curl -X 'GET' 'https://epncb.oma.be/PID/2021/319/ACOR00ESP\_2021319\_01D\_30S\_R3#obsdata  
?rinexVersion=all&star  
H'accept: application/
```

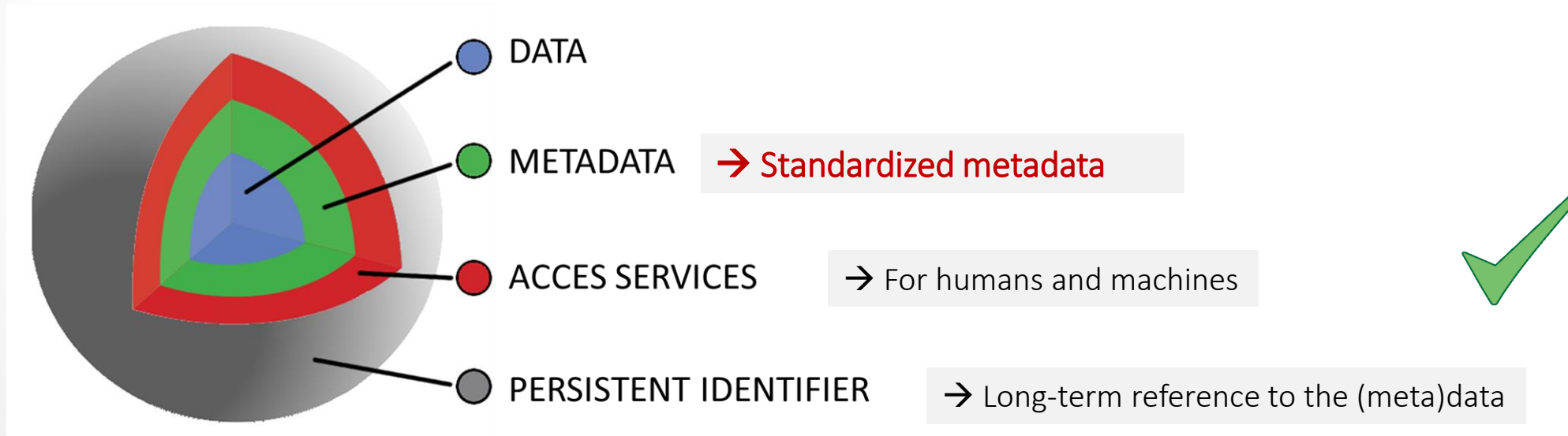
Output ?

```
"@graph": [  
  {  
    "@id": "https://epncb.oma.be/PID/2021/319/ACOR00ESP_2021319_01D_30S_R3",  
    "@type": "Distribution",  
    "accessURL": {  
      "@type": "xsd:anyURI",  
      "@value": "https://epncb.oma.be/pub/RINEX/2021/319/ACOR00ESP_R_20213190000_01D_30S_MO.crx.gz"  
    },  
    "adms:status": {  
      "@id": "https://publications.europa.eu/resource/authority/distribution-status/COMPLETED"  
    },  
    "compressFormat": "application/x-gzip",  
    "dataset": {  
      "@id": "https://epncb.oma.be/PID/ACOR00ESP"  
    },  
    "dct:checksum": {  
      "@id": "https://epncb.oma.be/PID/2021/319/ACOR00ESP_2021319_01D_30S_R3#obsdata"  
    },  
    "dct:conformsTo": {  
      "@id": "https://gnss.be/PID/standard#hatanaka"  
    },  
    "dct:description": "Daily RINEX data of the GNSS station ACOR00ESP for DOY 31 2021",  
    "dct:issued": {  
      "@type": "xsd:dateTime",  
      "@value": "2021-11-15T00:00:00"  
    },  
    "dct:license": {  
      "@id": "https://epncb.oma.be/PID/ACOR00ESP#license"  
    },  
    "dct:modified": {  
      "@type": "xsd:dateTime",  
      "@value": "2023-11-17T18:34:21"  
    },  
    "dct:title": "ACOR00ESP_R_20213190000_01D_30S_MO.crx.gz",  
    "downloadURL": {  
      "@type": "xsd:anyURI",  
      "@value": "https://epncb.oma.be/pub/RINEX/2021/319/ACOR00ESP_R_20213190000_01D_30S_MO.crx.gz"  
    },  
    "gnss:obsData": {  
      "@id": "https://epncb.oma.be/PID/2021/319/ACOR00ESP_2021319_01D_30S_R3#obsdata"  
    },  
  }  
]
```

Standardized
metadata
schema

Implementation of FAIR data principles

CREATION OF FAIR DIGITAL OBJECTS (FDO)



New DCAT Application Profile (DCAT-AP): GNSS-DCAT-AP

DCAT:

W3C vocabulary designed to facilitate interoperability between data catalogs

DCAT Application Profile =

set of metadata elements, policies and guidelines defined to create a standard metadata schema

for a particular application

e.g., GeoDCAT-AP (geospatial datasets, dataset series and services),

StatDCAT-AP (statistical data sets)

<https://joinup.ec.europa.eu/collection/semantic-interoperability-community-semic/solution/dcat-application-profile-data-portals-europe/release/211>



GNSS-DCAT-AP!

<https://doi.org/10.5281/zenodo.7777568>

(current version is 0.3)

```
"@graph": [
  {
    "@id": "https://epncb.oma.be/PID/2021/319/ACOR00ESP_2021319_01D_305_R3#temporal",
    "@type": "PeriodOfTime",
    "endDate": {
      "@type": "xsd:dateTime",
      "@value": "2021-11-15T23:59:30"
    },
    "startDate": {
      "@type": "xsd:dateTime",
      "@value": "2021-11-15T00:00:00"
    }
  },
  {
    "@id": "https://epncb.oma.be/PID/2021/319/ACOR00ESP_2021319_01D_305_R3",
    "@type": "Distribution",
    "accessURL": {
      "@type": "xsd:anyURI",
      "@value": "https://epncb.oma.be/pub/RINEX/2021/319/ACOR00ESP_R_2"
    },
    "adms:status": {
      "@id": "https://publications.europa.eu/resource/authority/dict"
    },
    "compressFormat": "application/x-gzip",
    "dataset": {
      "@id": "https://epncb.oma.be/PID/ACOR00ESP"
    },
    "dct:checksum": {
      "@id": "https://epncb.oma.be/PID/2021/319/ACOR00ESP_2021319_01D_305_R3#checksum"
    },
    "dct:conformsTo": {
      "@id": "https://gnss.be/PID/standard#hatanaka"
    },
    "dct:description": "Daily RINEX data of the GNSS station ACOR00ESP for DOY 319 of 2021",
    "dct:issued": {
      "@type": "xsd:dateTime",
      "@value": "2021-11-15T00:00:00"
    },
    "dct:license": {
      "@id": "https://epncb.oma.be/PID/ACOR00ESP#license"
    },
    "dct:modified": {
      "@type": "xsd:dateTime",
      "@value": "2023-11-17T18:34:21"
    },
    "dct:title": "ACOR00ESP_R_20213190000_01D_305_MO.crx.gz",
    "downloadURL": {
      "@type": "xsd:anyURI",
      "@value": "https://epncb.oma.be/pub/RINEX/2021/319/ACOR00ESP_R_20213190000_01D_305_MO.crx.gz"
    },
    "gnss:obsData": {
      "@id": "https://epncb.oma.be/PID/2021/319/ACOR00ESP_2021319_01D_305_R3#obsdata"
    },
    "mediaType": "application/octet-stream",
    "temporal": {
      "@id": "https://epncb.oma.be/PID/2021/319/ACOR00ESP_2021319_01D_305_R3#temporal"
    }
  },
  {
    "@id": "https://epncb.oma.be/PID/2021/319/ACOR00ESP_2021319_01D_305_R3#antenna",
    "gnss:igsModelCode": "LEIAT504 LEIS",
    "gnss:marker-arpEastEcc": {
      "@type": "xsd:float",
      "@value": "0.0"
    },
    "gnss:marker-arpNorthEcc": {
      "@type": "xsd:float",
      "@value": "0.0"
    },
    "gnss:marker-arpUpEcc": {
      "@type": "xsd:float",
      "@value": "3.046"
    }
  },
  {
    "@id": "https://epncb.oma.be/PID/2021/319/ACOR00ESP_2021319_01D_305_R3#obsdata",
    "@type": "xsd:float",
    "@value": "0.0"
  }
]
```

JSON-LD



Standardized
metadata
schema

GNSS-DCAT-AP

<https://doi.org/10.5281/zenodo.7777568>

Advantages:

- Combine metadata elements from multiple vocabularies (like DCAT, ISO)
- Extend existing vocabularies or application profiles with domain-specific metadata elements (IGS antenna/receiver types)

Context information:

- File has “completed” status
- Info on compression
- Last modified time
- Link to RINEX file
- Frequency is daily
- Link to station metadata

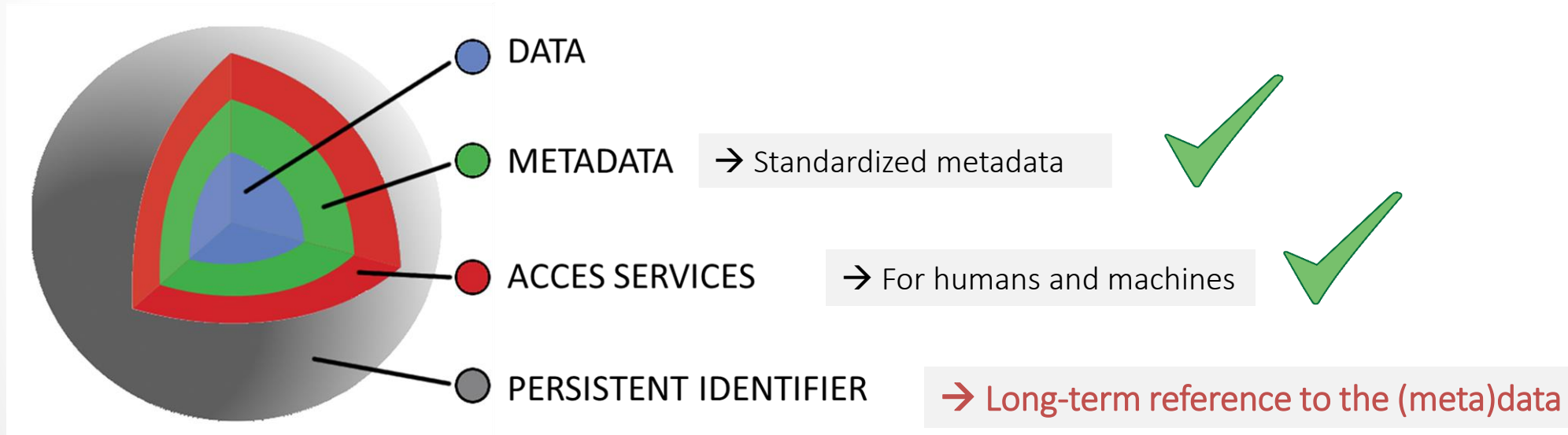
```
{
  "@context": {
    "@vocab": "https://www.w3.org/ns/dcat#",
    "adms": "http://www.w3.org/ns/adms#",
    "dcat": "https://www.w3.org/ns/dcat#",
    "dcatap": "http://data.europa.eu/r5r/",
    "dct": "http://purl.org/dc/terms/",
    "dctype": "http://purl.org/dc/dcmitype/",
    "foaf": "http://xmlns.com/foaf/0.1/",
    "gnss": "https://gnss.be/vocab/2023/gnss#",
    "xsd": "http://www.w3.org/2001/XMLSchema#"
  },
  "@graph": [
    {
      "adms:status": {
        "@id": "https://publications.europa.eu/resource/authority/distribution-status/COMPLETED"
      },
      "compressFormat": "application/x-gzip",
      "dataset": {
        "@id": "https://epncb.oma.be/PID/ACOR00ESP"
      },
      "dct:conformsTo": {
        "@id": "https://gnss.be/PID/standard#hatanaka"
      },
      "dct:modified": {
        "@type": "xsd:dateTime",
        "@value": "2023-11-17T18:34:21"
      },
      "dct:title": "ACOR00ESP_R_20213190000_01D_30S_M0.crx.gz",
      "downloadURL": {
        "@type": "xsd:anyURI",
        "@value": "https://epncb.oma.be/pub/RINEX/2021/319/ACOR00ESP_R_20213190000_01D_30S_M0.crx.gz"
      },
      "@id": "https://epncb.oma.be/PID/2021/319/ACOR00ESP_2021319_01D_30S_R3#obsdata",
      "@type": "gnss:OBSData",
      "gnss:frequency": {
        "@id": "http://purl.org/cld/freq/daily"
      },
      "gnss:station": {
        "@id": "https://epncb.oma.be/PID/ACOR00ESP#station"
      }
    }
  ]
}
```

JSON-LD

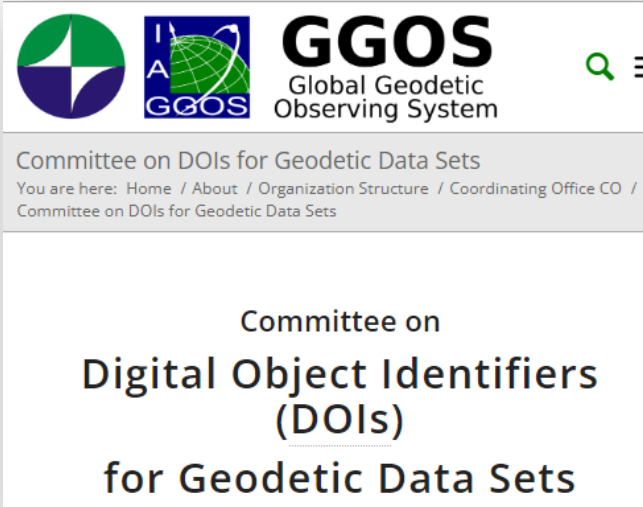


Implementation of FAIR data principles

CREATION OF FAIR DIGITAL OBJECTS (FDO)



Persistent Identifiers for GNSS Data: Digital Object Identifiers (DOI)



Agreement:

- DOI for dataset of a GNSS station is necessary
- DOI for datasets of GNSS networks should also be allowed!
- Both can be linked with each other

Development of tools to **collect existing DOI** in M³G

M³G - DOI for datasets of GNSS stations/networks

Upgrade of M³G software to allow station/network managers to insert GNSS network and/or GNSS station DOI in M³G

M³G Metadata Management and Distribution System for Multiple GNSS Networks

GNSS networks & projects

ABBREVIATION	NAME	Network DOI
FReDNet	Friuli Regional Deformation Network	10.6092/frednet
GFZ	Global network of the German Research Centre for Geosciences (GFZ)	10.5880/GFZ.1.1.2020.001
WALCORS	WALLonia Continuously Operating Reference System	10.24414/ROB-WALCORS
FLEPOS	Flemish Positioning Services	10.24414/ROB-FLEPOS
ROB_GNSS	ROB GNSS Network	10.24414/FST8-P256
PF	Piton de la Fournaise Volcano Observatory	10.18715/REUNION.OVPF
QM	Volcanological and seismological monitoring network of Mayotte (REVOSIMA)	10.18715/MAYOTTE.REVOSIMA
MQ	Martinique Seismic and Volcano Observatory	10.18715/MARTINIQUE.OVSM
GL	Guadeloupe Seismic and Volcano Observatory	10.18715/GUADELOUPE.OVSG
WI	GNSS permanent network in the French West Indies	10.18715/ANTILLES.WI

M³G Metadata Management and Distribution System for Multiple GNSS Networks

GNSS stations with metadata in M³G

9-CHAR ID	Station DOI	RESPONSIBLE AGENCY
ACOR00ESP	10.24414/ROB-EUREF-ACOR00ESP	IGE
ADAR00GBR	10.24414/ROB-EUREF-ADAR00GBR	OS
AGRN00ITA	not set	ASI
AJAC00FRA	not set	IGN_RGP
ALAC00ESP	10.24414/ROB-EUREF-ALAC00ESP	IGE
ALBA00ESP	10.24414/ROB-EUREF-ALBA00ESP	IGE
ALCI00UKR	not set	RIGC
ALME00ESP	10.24414/ROB-EUREF-ALME00ESP	IGE
AMMN00JOR	not set	RJGC
ANK200TUR	not set	HGM
ANKR00TUR	not set	GDM
AQUI00ITA	not set	ASI
ARA200SVN	not set	SMA
ARGI00FRO	not set	SDFI
ARIS00GBR	10.24414/ROB-EUREF-ARIS00GBR	OS

New service to provide DOI for EPN stations

Very few DOI inserted in M³G: station managers ask help to get DOI

→ **Development of new service provided to EUREF** based on EPN station metadata input in M³G

- **to assign DOIs** to datasets of EPN stations in EPN HDC
 - Only if no DOI is already existing
 - Manual process managed by EPN Central Bureau
- to export harmonized/standardized input for other agencies wishing to mint DOI for GNSS data (in concertation with GGOS)

→ **Station DOIs already available for 63 EPN stations**

Example of DOI landing page

<https://doi.org/10.24414/ROB-EUREF-ACOR00ESP>

Home / DOI / GNSS data of ACOR00ESP, A Coruna, Spain

GNSS data of ACOR00ESP, A Coruna, Spain

DOI:

Title:

Author:

Contributors:

Publisher:

Published:

Description:

Resource Type:

Data Citation:

Data Access:

Data License:

Station Information:

Related Resources:

More Metadata:

<https://doi.org/10.24414/ROB-EUREF-ACOR00ESP>

GNSS data of ACOR00ESP, A Coruna, Spain

Instituto Geografico Nacional de Espana (IGN)

-

Royal Observatory of Belgium (ROB)

2024

Permanent GNSS station dataset as daily RINEX files

[Dataset](#)

Instituto Geografico Nacional de Espana (IGN) (2024): GNSS data of ACOR00ESP, A Coruna, Spain, Available from Royal Observatory of Belgium
<https://doi.org/10.24414/ROB-EUREF-ACOR00ESP>

[National, EPN, and/or EPOS data access](#)

[CC BY 4.0](#)

[National, EPN, and/or EPOS station information](#)

[EPN](#)

[GNSS station metadata - GeodesyML](#)

[DOI metadata - DataCite](#)

[M³G Object Identifier](#)

Example of DOI landing page

Home / DOI / GNSS data of ACOR00ESP, A Coruna, Spain

GNSS data of ACOR00ESP, A Coruna, Spain

DOI:	https://doi.org/10.24414/ROB-EUREF-ACOR00ESP
Title:	GNSS data of ACOR00ESP, A Coruna, Spain
Author:	Instituto Geografico Nacional de Espana (IGN)
Contributors:	-
Publisher:	Royal Observatory of Belgium (ROB)
Published:	2024
Description:	Permanent GNSS station dataset as daily RINEX files
Resource	Dataset
Type:	
Data Citation:	Instituto Geografico Nacional de Espana (IGN) (2024): GNSS data of ACOR00ESP, A Coruna, Spain, Available from Royal Observatory of Belgium https://doi.org/10.24414/ROB-EUREF-ACOR00ESP
Data Access:	National, EPN, and/or EPOS data access
Data License:	CC BY 4.0
Station Information:	National, EPN, and/or EPOS station information
Related	EPN
Resources:	
More	GNSS station metadata - GeodesyML
Metadata:	DOI metadata - DataCite M³G Object Identifier

Link to Persistent Identifier of station metadata in M³G

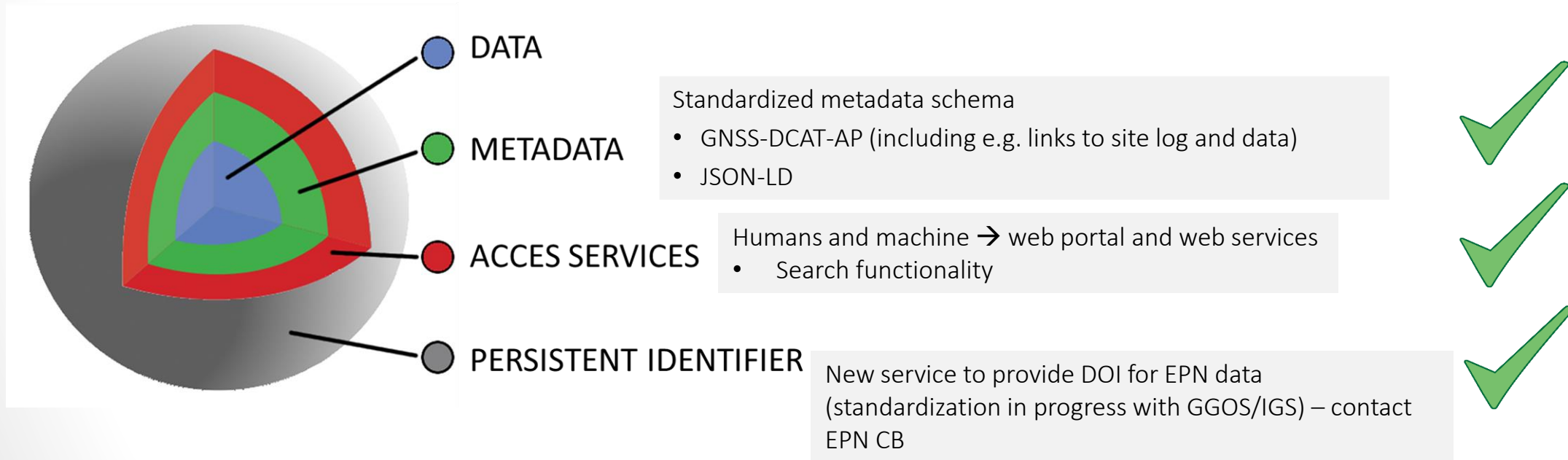
GNSS Station - ACOR00ESP

GNSS Station metadata - URI: <https://w3id.org/moid/station.5b39c8f1b6ae0c4a3432c612>

9-CHAR IDENTIFICATION	ACOR00ESP
IERS DOMES NUMBER	13434M001
SITE LOCATION, COUNTRY	A Coruna, Spain (ESP)
STATION OWNER	Instituto Geografico Nacional de Espana (IGE)
POINT OF CONTACT	ergnss(/at/)mitma.es, Instituto Geografico Nacional de Espana
INSTALLATION DATE	1998-03-06
STATION STATUS	Active
LAST ANTENNA	LEIAT504
LAST RECEIVER	LEICA GR50
LAST TRACKED SATELLITE SYSTEMS	GPS+GLO+GAL+BDS
IGS SITE LOG	View
CHANGE LOG	View
SITE PICTURES	View
DOWNLOAD METADATA FORMAT(S)	GeodesyML , IGS site log , EPOS json
LAST UPDATE OF SITE LOG	2024-04-11
METADATA MAINTAINER	ergnss(/at/)mitma.es, Instituto Geografico Nacional de Espana
DOI DAILY RINEX DATA	https://doi.org/10.24414/ROB-EUREF-ACOR00ESP
DATA LICENSE DAILY RINEX DATA	CC-BY-4.0
EMBARGO PERIOD DAILY RINEX DATA	no embargo period
NETWORK(S)	EPOS, EPN, ERGNSS
PROJECT(S)	E-GVAP, SONEI
EPN DATA ACCESS	EPN-HDC, BEV, BKGE
EPOS DATA ACCESS	ROB-EUREF, IGE, EPOS-GNSS Data Gateway, EPOS Data Portal
STATION INFORMATION	EPN Central Bureau, EPOS Data Gateway
STATION DATA QUALITY	EPN Central Bureau, EPOS Data Quality Monitoring System (ROB-EUREF, IGE)

MAP

CREATION OF FAIR DIGITAL OBJECTS (FDO)



Work to be continued !

- Populate additional optional metadata fields in GNSS-DCAT-AP
 - GNSS data quality indicator
 - File provenance
- Web services: first version
 - Extend search possibilities - add them slowly to ensure service speed is not deteriorated
- Web portal : beta version
 - User friendliness + documentation (examples)
- User authentication????
- Extend GNSS-DCAT-AP for GNSS products?

Data Portal – <https://gnss.be/opendataportal>

Documentation

The screenshot shows the 'Open Data Portal documentation' page on the GNSS.be website. The page has a blue header with the GNSS.be logo and navigation links. Below the header, the title 'Open Data Portal documentation' is displayed. The main content area features four grey boxes, each with an icon and a list of topics:

- GNSS DATA & METADATA FORMAT** (Icon: document with code symbols)
 - GNSS data format
 - GNSS metadata format
- GNSS DATA CITATION & USAGE CONDITIONS** (Icon: DOI and CC logos)
 - GNSS data citation
 - GNSS data usage conditions
- RETRIEVE GNSS DATA & METADATA FILES** (Icon: download arrow)
 - Output file formats
 - (Meta)data from the GUI
 - (Meta)data through the API
- PROCESS GNSS DATA & METADATA FILES** (Icon: line graph)
 - Plain text output
 - Simple JSON output
 - JSON-LD output

Contact

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Brussels

BELGIUM

Thank you for your attention

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