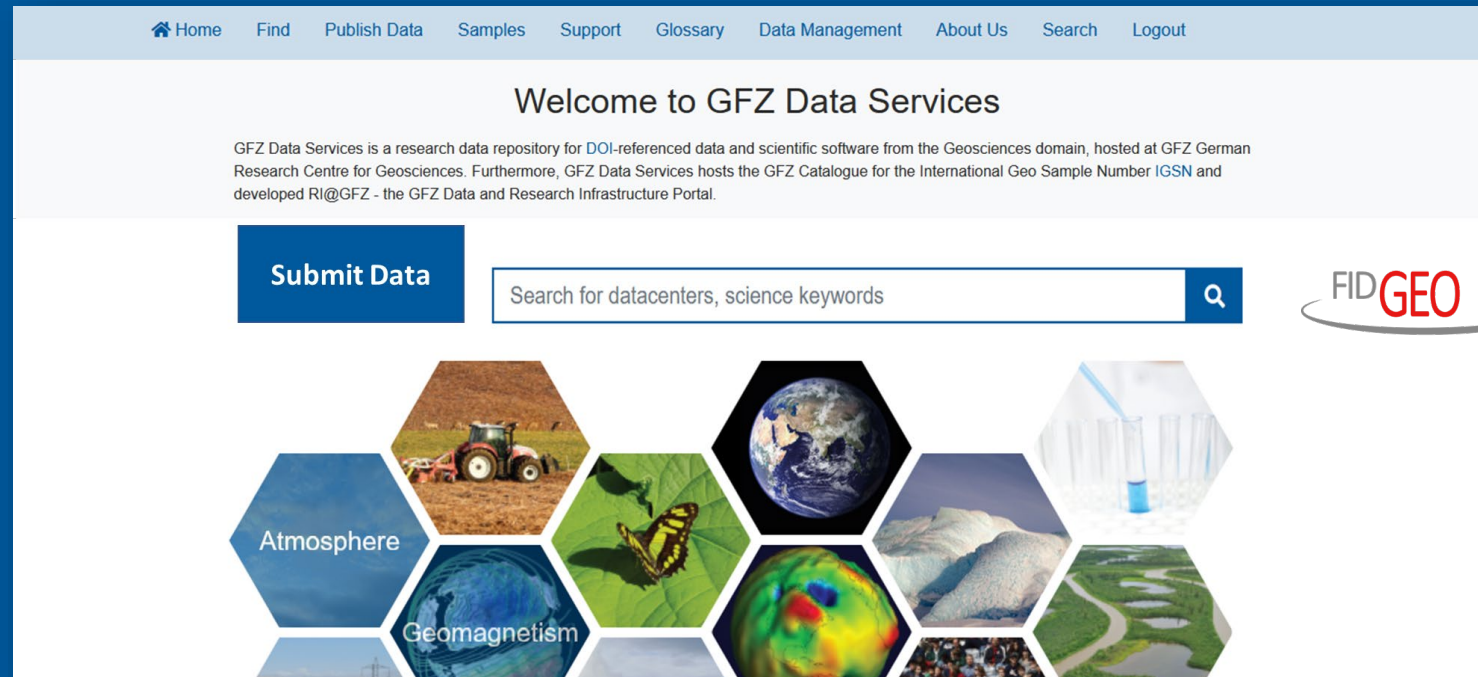


GFZ Data Services – A domain repository for geosciences data



Florian Ott , Kirsten Elger , Simone Frenzel 
GFZ German Research Centre for Geosciences, Potsdam, Germany




Data Publications – best practice for FAIR sharing data

Publication of datasets as individual publications (with assigned persistent Identifier, e.g., DOI) **through domain repositories**

- **Findable:** integration of standardised machine readable metadata in external data portals (e.g. DataCite, B2Find, Google Dataset Search)
- **Accessible:** via DOI, persistent data storage and access guaranteed by the publisher (= data repository)
- **Documented:** with metadata for discovery and reuse → curation
- **Citable:** DOI-referenced datasets are citable just as journal articles (→ credit for researcher and institution)

GFZ Data Services: Research Data Repository

Profile






- Domain repository for the Geosciences since 2006
- DOIs for Data and software
- Data: real-time data streams, tables, maps, model data, ...
- Data curation by domain scientists
- Partner of: 



<https://dataservices.gfz-potsdam.de>

FAIR data

- International metadata standards (human & machine readable)
- Controlled vocabularies for „rich“ metadata

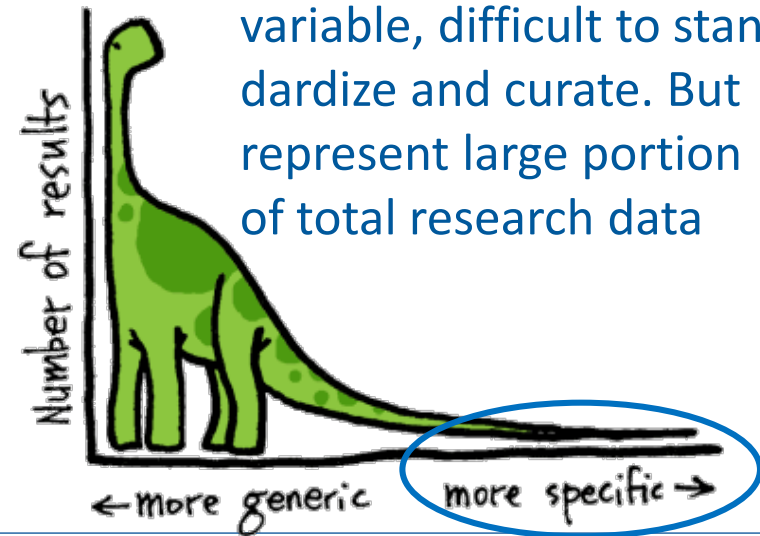
- PIDs     Connecting Research and Researchers  in prep
- Open Licences for data and software
- OAI-PMH interface
- schema.org → Google Dataset Search

GFZ Data Services: Profile

Focus:

1. curation of long-tail data

long-tail data: small in size, highly variable, difficult to standardize and curate. But represent large portion of total research data

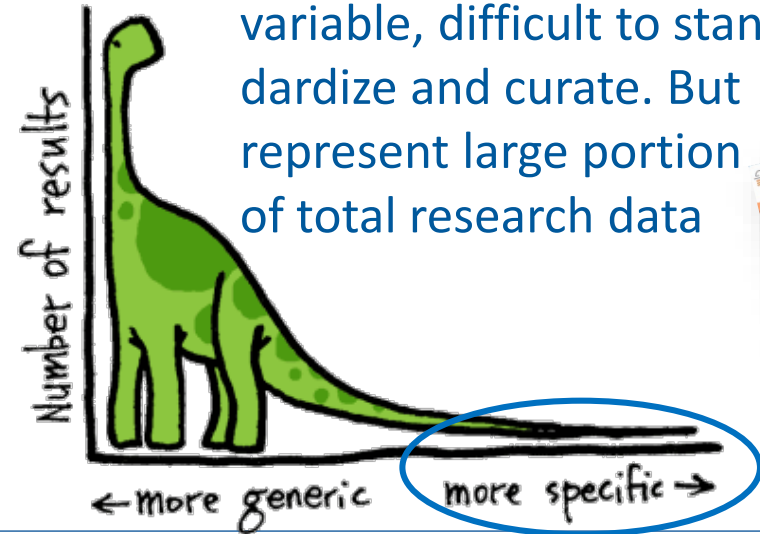


GFZ Data Services: Profile

Focus:

1. curation of long-tail data
2. DOI minting services for global monitoring networks/observatories in geodesy and geophysics and collaborative projects.

long-tail data: small in size, highly variable, difficult to standardize and curate. But represent large portion of total research data



Different layouts for DOI Landing Pages

What do I need for a data publication?

- Data
- Metadata

Contextual Metadata

highly variable
between the
disciplines but key
information for
data reuse

README

Datei Bearbeiten Format Ansicht ?
AVERTISSEMENT / WARNING
 Même si des efforts sont déployés pour
 Although efforts are made to ensure the
AUTEUR(S) / AUTHOR(S)
 Centre d'études nordiques
RÉSUMÉ / SUMMARY
 Les données de ce numéro de Nordica
 The datasets in this issue of Nordica
CITATION DES DONNÉES / DATA CITATION
 CEN 2014. Données environnementales
 CEN 2014. Environmental data from
SITE(S)
 Nom / Name
 Ellesmere Parks Canada (ELLEPAR) 83.09396
DESCRIPTION
 SITE: Ellesmere Parks Canada (ELLEPAR)
 Profondeurs des / températures de sol (m) / Ground temperature depth range (m): 0.20
MESURE(S) / MEASUREMENT(S)
 TYPE: Température moyenne du sol (Degré celsius (°C)) / Average ground temperature (Degree Celsius (°C))

Definition of data labels

Metadata of the Data Tables

Sites

	Column Name	Data Type	Description	Validation Text	Unit
1	EXPEDITION	Numeric	expedition number	integer value	#
2	SITE	Numeric	site number	integer value	#
3	NAME	Text	site name or locality	text string of max. 40 characters	#
4	PLATFORM	Text	platform identifier, C=Chikyu, J=Joides, M=Mission Specific, R=Drill Rig	text string of max. 1 character	#
5	LATITUDE_DEG	Integer	decimal degrees of site latitude (latitude of hole 'A')	integer value between 0 and 90	deg.
6	LATITUDE_MIN	Double	decimal minutes of site latitude (latitude of hole 'A')	real value	min.
7	LATITUDE_DIR	Text	direction latitude	text string of max. 1 character	#
8	LONGITUDE_DEG	Integer	decimal degrees of site longitude (longitude of hole 'A')	integer value between 0 and 180	deg.
9	LONGITUDE_MIN	Double	decimal minutes of site longitude	real value	min.
10	LONGITUDE_DIR	Text	direction site longitude	text string of max. 1 character	m
11	DATE_START	Date	date of site start	date in UTC	dd-mmm-yyyy
12	DATE_END	Date	date of site end	date in UTC	dd-mmm-yyyy

Data Articles/ Reports



Metadata for data discovery: example DOI Landing Page

title citation

download data

key paper

related work

GFZ DATA SERVICES
GEOSCIENCES DATA PUBLISHER

Dataset Data from distributed temperature sensing (DTS) measured along a fiber optic cable permanently installed behind casing in well RN-15/DEEPEGS/IDDP-2, Iceland

Cite as:
Lipus, Martin Peter; Reinsch, Thomas (2021): Data from distributed temperature sensing (DTS) measured along a fiber optic cable permanently installed behind casing in well RN-15/DEEPEGS/IDDP-2, Iceland. GFZ Data Services. <https://doi.org/10.5880/GFZ.6.2.2018.0>

Files
Download data and description
License: CC BY 4.0
End of moratorium: 2020-06-31

Abstract
The fiber optic cable was installed down to 832 m behind the production casing of a 9 5/8" (445-2932 m) and 9 7/8" (0 - 445 m) production casing in well RN-15/DEEPEGS/IDDP-2 in the Reykjanes geothermal field, SW Iceland (depth reference: surface). Fiber optic distributed temperature data was acquired (campaign based) during cementation (09/2016) of the production casing, at the end of the cold fluid injection (09/2018) as well during the onset of well stimulation (10/2019-04/2020).

Authors
Lipus, Martin Peter; GFZ German Research Centre for Geosciences, Potsdam, Germany
Reinsch, Thomas; GFZ German Research Centre for Geosciences, Potsdam, Germany; Fraunhofer IEG, Fraunhofer Research Institution for Energy Infrastructures and Geothermal Systems IEG, Bochum, Germany

Contact
Lipus, Martin (Researcher) : GFZ German Research Centre for Geosciences, Potsdam, Germany; →

Contributors
Cunow, Christian; Raab, Tobias; Lipus, Martin

Keywords
permanent temperature monitoring, cementation, energy > energy source > renewable energy source, industrial process > drilling
GCMD Science Keywords
EARTH SCIENCE > SOLID EARTH > GEOTHERMAL DYNAMICS > GEOTHERMAL ENERGY
EARTH SCIENCE > SOLID EARTH > GEOTHERMAL DYNAMICS > GEOTHERMAL TEMPERATURE
EARTH SCIENCE > SOLID EARTH > GEOTHERMAL DYNAMICS > GEOTHERMAL TEMPERATURE > TEMPERATURE PROFILES

More Metadata
datacite: [view inline](#) / [download xml](#)
iso19115: [view inline](#) / [download xml](#)

Location
Click/hover over markers or bounding boxes to see related details. Click/hover over details to see related marker or bounding box.

description/abstract

authors/ ORCID

keywords/controlled vocabularies

spatial coverage

Essential for data discovery, DOI registration, etc: international standards across all disciplines

Typical metadata standards for data discovery: DataCite, ISO19115, Dublin Core

Tools for data publications by GFZ Data Services

1. Discovery Metadata: via GFZ Metadata Editor

The screenshot displays the GFZ Metadata Editor interface. At the top, there are tabs for 'Discovery Metadata', 'ISO19115 Metadata', 'Files', and 'Related Publications'. The main content is divided into several sections:

- Resource Information:** Contains fields for 'DOI will be generated in the publishing process', 'Publisher' (GFZ DATA SERVICES), 'Year' (2020), 'Resource Type' (Dataset), 'Title' (Supplement to: The New World Atlas of Artificial Night Sky Brightness), and 'Language of Subject' (eng).
- License and Rights:** Includes a 'License' field with the text 'Please contact the authors for a license agreement'.
- Authors (Persons and/or Institutions):** A table listing authors with columns for 'Author (Lastname, Firstname)', 'Role', 'Author ID Type', 'Author Identifier (ID)', and 'Affiliation'. The listed authors include:
 - Duceno, Mercedes
 - Duceno, Dan
 - Kubi, Christopher C. M.
 - Prada, Christoph D.
 - Beauf, Kimberly
 - Parton, Beate
 - Rytkowski, Katalya J.
 - Furzer, Ricardo
- Contact Person(s) / Point of Contact:** A section at the bottom for contact information.

GFZ Metadata Editor (Java Script „translator“)

Input: provided by researchers

Output: XML (Extensible Markup Language): Metadata exchange format

The screenshot displays the GFZ Metadata Editor interface. On the left, the 'Input' section shows various metadata fields:

- DataCite Metadata** tab selected.
- Resource Information:** DOI (will be generated in the publishing process) 10.5880/GFZ.1.4.2016.001, Resource Type: Dataset, Title: Supplement to: The New World Atlas of Artificial Night Sky Brightness.
- Licenses and Rights:** Licence: Attribution-NonCommercial 4.0 International (CC BY-NC 4.0).
- Authors (Persons and/or Institutions):** Table with columns: Lastname, Firstname, Role, Author ID Type. Authors include Falchi, Cinzano, Duriscoe, Kyba, Ehidge, Baugh, Portnov, Rybnikova, and Furgoni.
- Contact Person(s) / Point of Contact:** night, radiative transfer, Suomi NPP, Sky Quality Meter.
- Temporal and Spatial Coverage:** Table with columns: Latitude (Min, Max), Longitude (Min, Max). Values: 44.045486..., 55.842428..., 2.8710901..., 43.124996...

On the right, the 'Output' section shows the generated XML metadata in a tree view:

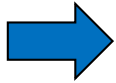
```
iso19115: close inline view / download xml
o MD_Metadata (xsi:schemaLocation=http://www.isotc211.org/2005/gmd http://www.isotc211.org/2005/gmd/gmd.xsd)
  ■ fileIdentifier
    ■ CharacterString: doi:10.5880/igets.po.11.001
  ■ language
    ■ LanguageCode (codeList=http://www.loc.gov/standards/iso639-2/ codeListValue=eng): eng
  ■ characterSet
    ■ MD_CharacterSetCode (codeList=http://www.isotc211.org/2005/resources/codeList.xml#MD_CharacterSetCode codeListValue=utf8):
  ■ hierarchyLevel
    ■ MD_ScopeCode (codeList=http://www.isotc211.org/2005/resources/Codelist/gmx-Codelists.xml#MD_ScopeCode codeListValue=):
  ■ hierarchyLevelName
    ■ CharacterString:
  ■ contact
    ■ CI_ResponsibleParty
      ■ organisationName
        ■ CharacterString: GFZ German Research Center for Geosciences
      ■ contactInfo
        ■ CI_Contact
          ■ address
            ■ CI_Address
              ■ electronicMailAddress
                ■ CharacterString:
          ■ onlineResource
            ■ CI_OnlineResource
              ■ linkage
                ■ URL: http://www.gfz-potsdam.de/
              ■ function
                ■ CI_OnLineFunctionCode (codeList=http://www.isotc211.org/2005/resources/Codelist/gmxCodelists.xml#CI_OnLineFunctionCode codeListValue=):
            ■ role
              ■ CI_RoleCode (codeList=http://www.isotc211.org/2005/resources/Codelist/gmxCodelists.xml#CI_RoleCode codeListValue=pointOfContact): pointOfContact
          ■ dateStamp
            ■ Date: 2017-01-06
        ■ referenceSystemInfo
          ■ MD_ReferenceSystem
            ■ referenceSystemIdentifier
              ■ RS_Identifier
                ■ code
                  ■ CharacterString: urn:ogc:def:crs:EPSG:4326
          ■ identificationInfo
            ■ MD_DataIdentification
              ■ citation
```

Access via: <https://dataservices.gfz-potsdam.de/portal/> → Submit Metadata

GFZ Metadata Editor (Java Script „translator“)

Input:

provided by researchers



The screenshot shows the GFZ Metadata Editor interface with the following sections:

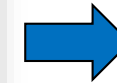
- Resource Information:**
 - DOI (will be generated in the publishing process): 10.5880/GFZ.1.4.2016.001
 - Publisher: GFZ Data Services
 - Year: 2016
 - Resource Type: Dataset
 - Title: Supplement to: The New World Atlas of Artificial Night Sky Brightness
 - Language of dataset: eng
- Licenses and Rights:**
 - Licence: Attribution-NonCommercial 4.0 International (CC BY-NC 4.0)
 - Rights URI: https://creativecommons.org/licenses/by-nc/4.0/
- Authors (Persons and/or Institutions):**

Lastname	Firstname	Role	Author ID Type	Author Identifi...	Affiliation	Affiliation2	Affiliation3
Falchi	Fabio		ORCID	0000-0002-3706-...	ISTIL - Istituto di...		
Cinzano	Pierantonio				ISTIL - Istituto di...		
Duriscoe	Dan				National Park S...		
Kyba	Christopher C. M.		ORCID	0000-0001-7014-...	GFZ German Re...		
Ehidge	Christopher D.		ORCID	0000-0003-0584-...	Earth Observatio...		
Baugh	Kimberly		ORCID	0000-0002-3548-...	Cooperative Insti...		
Portnov	Boris		ORCID	0000-0003-1537-...	Department of N...		
Rybnikova	Nataliya A.		ORCID	0000-0002-3135-...	Department of N...		
Furgoni	Riccardo				ISTIL - Istituto di...		
- Contact Person(s) / Point of Contact:**
 - night
 - radiative transfer
 - Suomi NPP
 - Sky Quality Meter
- Temporal and Spatial Coverage (The EDIT-symbol to the left provides vi...):**

Latitude		Longitude	
Min	Max	Min	Max
44.045486...	55.842428...	2.8710901...	43.124996...
- Interactive Map:** A map showing a selected region in Europe with a red border. The map includes labels for countries like Deutschland, Polen, and Ukraine, and a search bar for "Select Region (click left mouse and drag)".

Output:

Standardised XML files (Datacite, ISO 19115, Dublin Core)



DOI Landing Pages



Data Catalogue



Standardised API



„Special“ Features:

- Interactive map
- Searchable vocabulary lists

Access via: <https://dataservices.gfz-potsdam.de/portal/> → Submit Metadata

Metadata harvesting to other portals

Original data publication



DATA CATALOGUE REPOSITORIES

Dataset Rheology of PDMS-corundum sand mixt

DataCite Search

Cite as
Zwaan
Lab of

Downloads

- Zwaan-et-al-2018_List_of_files.pdf
- 2018-023_Zwaan-et-al_Description of data.pdf

Datasets

Spatial Coverage

© OpenStreetMap contributors.

Temporal Coverage

pdms

28 datasets found for 'pdms'

Repositories: **GFZ Data Services**

Rheology of PDMS-corundum sand mix

This dataset provides rheometric data of silic used for analogue modelling in Zwaan et al. (

Google

multi-scale laboratories

GFZ GER

Rheology of PDMS-corundum sand mixtures from the Tectonic Modelling Lab of...

dataservices.gfz-potsdam.de

Aktualisiert: 2018

Mehr unter dataservices.gfz-potsdam.de



Mechanical data and

40 wissenschaftliche Artikel zitieren diesen Datenpool (In [Google Scholar](#))

Tools for data publications by GFZ Data Services

1. Discovery Metadata: via GFZ Metadata Editor
2. Contextual Metadata: via [Data Description Templates](#)
(or [data reports](#))

Paleosol-derived data used for the reconstruction of environmental conditions during the Holocene in the upper part of the Kali Gandaki valley, Central Nepal
(<http://doi.org/10.5880/GFZ.4.6.2019.001>)

Johanna Menges¹, Niels Hovius², Christoff Andermann¹, Michael Dietze¹, Charlie Swoboda¹, Kristen Cook¹, Basanta Adhikari², Andrea Vieth-Hillebrand¹, Stephane Bonnet³, Tony Reimann⁴, Andreas Koutsodendris³, Dirk Sachse¹

1. *GFZ German Research Centre For Geosciences, Telegrafenberg, 14473 Potsdam, Germany*
2. *Department of Civil Engineering, Pulchowk Campus, Institute of Engineering, Tribhuvan University, Nepal*
3. *GET CNRS Univ Toulouse, UMR 5563, Toulouse, France*
4. *Soil Geography and Landscape group & Netherlands Centre for Luminescence dating, Wageningen University, The Netherlands*
5. *Heidelberg University Institute of Earth Sciences, Heidelberg, Germany*

Data Description Templates

Available in
„commented“ and
„usable“ form

- Many users are unaware of what a data publication represents and what to include in description
 - Increase the quality of metadata
 - Reduces curation workload
 - Uniform format aids comprehension
- Template via [gfzpublic](https://gfzpublic.gfz-potsdam.de/pubman/item/item_5007103) (https://gfzpublic.gfz-potsdam.de/pubman/item/item_5007103)

Paleosol-derived data used for the reconstruction of environmental conditions during the Holocene in the upper part of the Kali Gandaki valley, Central Nepal
(<http://doi.org/10.5880/GFZ.4.6.2019.001>)

Johanna Menges¹, Niels Hovius¹, Christoff Andermann¹, Michael Dietze¹, Charlie Swoboda¹, Kristen Cook², Basanta Adhikari², Andrea Vieth-Hillebrand², Stephane Bonnet³, Tony Reimann⁴, Andreas Koutsodendris⁵, Dirk Sachse¹

1. GFZ German Research Centre For Geosciences, Telegrafenberg, 14473 Potsdam, Germany
2. Department of Civil Engineering, Pulchowk Campus, Institute of Engineering, Tribhuvan University, Nepal
3. GET CNRS Univ Toulouse, UMR 5563, Toulouse, France
4. Soil Geography and Landscape group & Netherlands Centre for Luminescence dating, Wageningen University, The Netherlands
5. Heidelberg University Institute of Earth Sciences, Heidelberg, Germany

1. Licence

Creative Commons Attribution 4.0 International License (CC BY 4.0)



2. Citation

These data are freely available under the Creative Commons Attribution 4.0 International License (CC BY 4.0).

When using the data please cite:

Menges, J.; Hovius, N.; Andermann, C.; Dietze, M.; Swoboda, C.; Cook, K.; Adhikari, B.; Vieth-Hillebrand, A.; Bonnet, S.; Reimann, T.; K., Andreas; Sachse, D. (2019): Paleosol-derived data used for the reconstruction of Holocene environmental conditions during in the upper Kali Gandaki valley, Central Nepal. GFZ Data Services. <http://doi.org/10.5880/GFZ.4.6.2019.001>

The data are supplementary to:

Menges, J., Hovius, N., Andermann, C., Dietze, M., Swoboda, C., Cook, K. L., ... Sachse, D. (2019). Late

1. Licence
2. Citation
3. Data Description
 - Sampling method
 - Analytical procedure
 - Data processing
4. File description
 - File inventory
 - File naming convention
 - Description of data tables
5. References

Tools for data publications by GFZ Data Services

1. Discovery Metadata: via GFZ Metadata Editor
2. Contextual Metadata: via Data Description Templates (or data reports)

3. Data Discovery and access via the Data Portal

<https://dataservices.gfz-potsdam.de>



The screenshot displays the GFZ Data Services Data Portal interface. At the top, the GFZ logo and 'GFZ DATA SERVICES' are visible. Below the header, there is a search bar and a spatial filter section. The search results are displayed in a list format, with each entry including a map thumbnail, a title, authors, and an abstract. The first result is 'ESA's Release 6 GOCE gravity field model by means of the direct approach based on improved filtering of the reprocessed gradients of the entire mission (GO_CONS_GCF_2_DIR_R6)'. The second result is 'Revised dataset of known faults in Italy'. The third result is 'Temporary passive seismic data acquired at Rittershoffen geothermal field Alsace, France, 2013-2014 (TOPASE) - Datasets'. The interface also includes a 'Current Selection (Link)' section and a 'Datacenters' list.

Special Features: „Data in Review“ Links

- Link: <https://dataservices.gfz-potsdam.de/panmetaworks/review/9c5de649b6b30c588f9fecad56a1c71dd56d1fb4f68ada89b9340002ff84abb7/>
- Allows access to still unregistered data (for review purposes)
- DOI is reserved and citable
- Data can still be changed
- DOI registration when paper is accepted



JOURNAL REQUIREMENTS

GFZ DATA SERVICES
GEOSCIENCES DATA PUBLISHER

Dataset Chemical (EPMA) and boron isotope (SIMS) analyses on tourmaline breccias from the Río Blanco-Los Bronces porphyry copper district, Chile Released

Status
IN REVIEW: Hohf, Michael; Trumbull, Robert (2022): Chemical (EPMA) and boron isotope (SIMS) analyses on tourmaline breccias from the Río Blanco-Los Bronces porphyry copper district, Chile. GFZ Data Services. <https://doi.org/10.5880/GFZ.3.1.2022.002>

Files
[Download data and description](#)
License: CC BY 4.0

Related Work
Cites
Catanzaro, E.J., Champion, C.E., Garner E. L., Marienko, O., Sappenfield, K.M., and Shields, W.R., 1970, Boric acid: isotopic and assay standard reference materials: US NBS Special Publication 216-17, 70pp. <https://nvlpubs.nist.gov/nistpubs/Legacy/SP/nbsspecialpublication260-17.pdf>
Dyar, M. D., Wiedenbeck, M., Robertson, D., ...
Freiberg and O...
Frederic Couffign...

Make Data FAIR
Findable
Accessible
Interoperable
Reusable
AGU100


Please inform GFZ Data Services when a paper is accepted and send the DOI of the paper once known.

Special Features: DOIs for software

Resource type →


Software
Cite as:
Ziegler, Moritz O.; Heidbach, Oliver (2021): Matlab Script

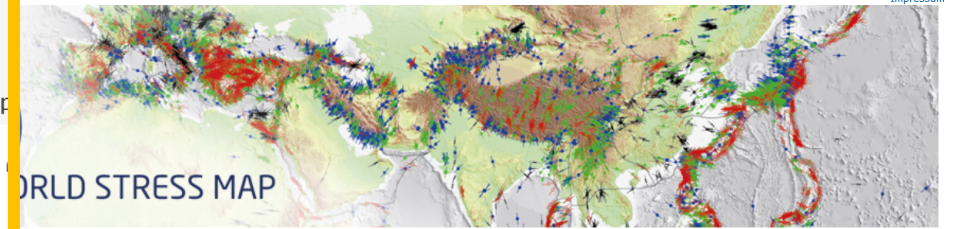
Download static version →

Files 
[Download data and description](#)
[Link to project page on GitHub](#)
[Readme/ Copyright](#)
[Licence](#)

Link to GitHub project page →

Open Source Software License →

License: [GNU General Public License Version 3 \(29 June 2007\)](#); Copyright (C) 2021 Helmholtz Centre Potsdam GFZ German Research Centre for Geosciences, Potsdam, Germany



Matlab Script FAST Calibration v.2.0

Released 

[Copy citation to clipboard](#)

Ziegler, Moritz O.; Heidbach, Oliver (2021): Matlab Script FAST Calibration v.2.0. V. 2.0. GFZ Data Services. <https://doi.org/10.5880/wsm.2021.002>

Abstract 

The 3D geomechanical-numerical modelling aims at a continuous description of the stress state in a subsurface volume. The model is fitted to the model-independent stress data records by adaptation of the displacement boundary conditions. This process is herein referred to as model calibration. Depending on the amount of available stress data records and the complexity of the model the calibration can be a lengthy process of trial-and-error to estimate the best-fit boundary conditions. The tool FAST Calibration (Fast Automatic Stress Tensor Calibration) is a Matlab script that facilitates and speeds up this calibration process. By using a linear regression it requires only three test model scenarios with different displacement boundary conditions to calibrate a geomechanical-numerical model on available stress data records. The differences between the modelled and observed stresses are used for the linear regression that allows to compute the displacement boundary conditions required for the best-fit estimation. The influence of observed stress data records on the best-fit displacement boundary conditions can be weighted. Furthermore, FAST Calibration provides a cross checking of the best-fit estimate against indirect stress information that cannot be used for the calibration process, such as the observation of borehole breakouts or drilling induced fractures.

Additional Information

GNU General Public License, Version 3, 29 June 2007

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FAST Calibration is free software: you can redistribute it and/or modify it under the terms of the GNU General Public License as published by the Free Software Foundation, either version 3 of the License, or (at your option) any later version.

FAST Calibration is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU General Public License for more details. You should have received a copy of the GNU General Public License along with this program. If not, see <http://www.gnu.org/licenses/>.

The screenshot shows the GitHub interface for the repository 'MorZieg / FAST_Calibration'. The navigation bar includes 'Product', 'Solutions', 'Open Source', and 'Pricing'. The repository name is 'MorZieg / FAST_Calibration' with a 'Public' badge. Below the name are tabs for 'Code', 'Issues', 'Pull requests', 'Actions', 'Projects', 'Security', and 'Insights'. The main content area shows the 'master' branch selected, with '1 branch' and '1 tag' indicators. A 'Go to file' button and a 'Code' button are visible. At the bottom, a commit entry is shown: 'Moritz Ziegler FAST Calibration v2.0' by user '3e9639e' on '12 Mar 2021' with '9 commits'.

of the Matlab Script
Z German Research
<https://doi.org/10.48440/>

al of the Matlab Script
Z German Research
<https://doi.org/10.48440/>

Special Features: DOIs for software

Resource type →



Software

Cite as:

Ziegler, Moritz O.; Heidbach, Oliver (2021): Matlab Script

Download static version →

Files



- [Download data and description](#)
- [Link to project page on GitHub](#)
- [Readme/ Copyright](#)
- [Licence](#)

Link to GitHub project page →

Open Source Software License →

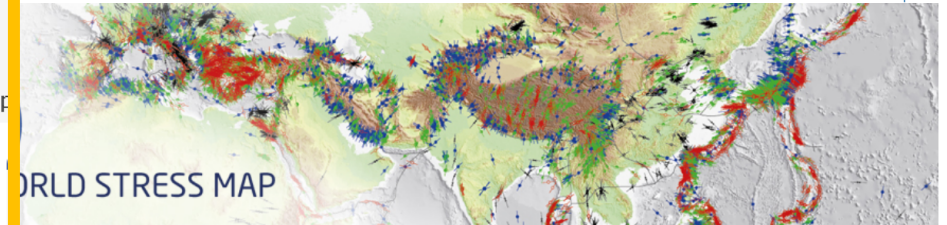
License: [GNU General Public License Version 3 \(29 June 2007\)](#); Copyright (C) 2021 Helmholtz Centre Potsdam GFZ German Research Centre for Geosciences, Potsdam, Germany

Manual published as data report →

Software Description

Documented by

Ziegler, M. (2021). *Manual of the Matlab Script FAST Calibration v2.0*. GFZ German Research Centre for Geosciences. <https://doi.org/10.48440/WSM.2021.002>



Matlab Script FAST Calibration v2.0



Copy citation to clipboard

ch, Oliver (2021): Matlab Script FAST Calibration v2.0. V. 2.0. GFZ Data Services. <https://doi.org/10.5880/wsm.2021.002>

Abstract

The 3D geomechanical-numerical modelling aims at a continuous description of the stress state in a subsurface volume. The model is fitted to the model-independent stress data records by adaptation of the displacement boundary conditions. This process is herein referred to as model calibration. Depending on the amount of available stress data records and the complexity of the model the calibration can be a lengthy process of trial-and-error to estimate the best-fit boundary conditions. The tool FAST Calibration (Fast Automatic Stress Tensor Calibration) is a Matlab script that facilitates and speeds up this calibration process. By using a linear regression it requires only three test model scenarios with different displacement boundary conditions to calibrate a geomechanical-numerical model on available stress data records. The differences between the modelled and observed stresses are used for the linear regression that allows to compute the displacement boundary conditions required for the best-fit estimation. The influence of observed stress data records on the best-fit displacement boundary conditions can be weighted. Furthermore, FAST Calibration provides a cross checking of the best-fit estimate against indirect stress information that cannot be used for the calibration process, such as the observation of borehole breakouts or drilling induced fractures.

Additional Information

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New Website launched in April 2022

- Responsive design
- Thematic search options
- Comprehensive **Publication instructions** (quick start guide, data file instructions, data description templates, ...)
- **Portals:**
 - GFZ Data Services catalogue: DOI-referenced data
 - RI@GFZ: discovery portal for data and research infrastructure at GFZ
 - GFZ Sample Catalogue (IGSN)

The screenshot shows the homepage of the GFZ Data Services website. At the top, there is a dark blue header with the text "GFZ Data Services" on the left and the "GFZ Helmholtz Centre POTSDAM" logo on the right. Below the header is a navigation bar with links for "Home", "Find", "Publish Data", "Support", and "About Us". The main content area features a "Welcome to GFZ Data Services" message, followed by a paragraph describing the service as a research data repository for DOI-referenced data and scientific software. Below this is a search bar with the placeholder text "Search for datacenters, science keywords" and a "SUBMIT METADATA" button. The bottom section of the page is a collage of hexagonal images representing various scientific fields, with "Climate Science" and "Geochemistry" highlighted in blue hexagons.