

# Hydraulic Characterization Data Collected Pre- and Post-hydraulic fracturing experiments for Stress Measurement at Grimsel Test Site

**Dataset****Author(s):**

[Jalali, Reza](#)  Klepikova, Maria

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## Data File Description

In these folders, we publish data recorded during seven small-scale hydraulic fracturing (HF) and one small-scale hydraulic testing on pre-existing structures (HTPF) experiments performed at the Grimsel test site in September and October 2015 as part of the stress measurement campaign for the In-situ Stimulation and Circulation (ISC) experiment. They set the basis for the following publications:

- Jalali, M., Gischig, V., Doetsch, J., Näf, R., Krietsch, H., Klepikova, M., Amann, F., Giardini, D. (2018). Transmissivity changes and microseismicity induced by small-scale hydraulic fracturing tests in crystalline rock. *Geophysical Research Letters*, 45. <https://doi.org/10.1002/2017GL076781>
- Gischig, V. S., Doetsch, J., Maurer, H., Krietsch, H., Amann, F., Evans, K. F., et al. (2018). On the link between stress field and small-scale hydraulic fracture growth in anisotropic rock derived from microseismicity. *Solid Earth*, 9, 39–61. <https://doi.org/10.5194/se-9-39-2018>

The HF tests are numbered HF1-HF7 from south to north. HF1, HF2, and HF3 were done in SBH3 borehole and HF4-HF7 were performed in SBH4 borehole. The HTPF test which was done at the bottom of SBH4 borehole is referred to HF8 test in this dataset for convenience.

**Note that all the coordinates are in meters and are referred to a point  $X_0 = 667400$ ,  $Y_0 = 158800$ ,  $Z_0 = 1700$  in the Swiss Coordinate System CH1903.**

### HydraulicCharacterization\_SBH3 Folder

This folder contains the *SBH3TestDescription.txt* as well as 12 time vs. pressure text files for all the conducted pulse injection (PI) and constant rate injection (RI) tests pre- and post-HFs in the SBH3 boreholes.

- *SBH3TestDescription.txt*

This file contains the name of the conducted hydraulic tests, their date and time, test duration [sec], interval depth [m], and injected mass [gr] for PI or injection rate [lit/min] for RI tests. The following convention was adopted for the name of hydraulic tests:

FileName:        **xxxHF#\_SBH3\_TEST#**

**xxx:** Pre/Pos                      Chronological status of the test, either pre-HF (Pre) or post-HF (Pos)

**HF#:** HF1-3                        Name of the conducted hydraulic fracturing test

**TEST#:** PI01/RI01                type and number of conducted hydraulic tests, i.e. pulse injection (PI) and rate injection (RI)

The other txt files in the folder contain elapsed time in seconds (first column) and interval pressure in kPa (second column).

### HydraulicCharacterization\_SBH4 Folder

This folder contains the *SBH4TestDescription.txt* as well as 23 time vs. pressure text files for all the conducted pulse injection (PI) and constant rate injection (RI) tests pre- and post-HFs in the SBH4 boreholes.

- *SBH4TestDescription.txt*

This file contains the name of the conducted hydraulic tests, their date and time, test duration [sec], interval depth [m], and injected mass [gr] for PI or injection rate [lit/min] for RI tests. The following convention was adopted for the name of hydraulic tests:

FileName:       xxxHF#\_SBH4\_TEST#  
xxx: Pre/Pos       Chronological status of the test, either pre-HF (Pre) or post-HF (Pos)  
HF#: HF4-8       Name of the conducted hydraulic fracturing test (Note that HF8 corresponds to HTPF1 test in SBH4).  
TEST#: PI01/RI01   type and number of conducted hydraulic tests, i.e. pulse injection (PI) and rate injection (RI)

The other txt files in the folder contain elapsed time in seconds (first column) and interval pressure in kPa (second column).

#### InjectionData Folder

The *InjectionData* folder contains the time series for injection rate ('flow'), injection pressure ('Pi'), and pressure of packers ('Pp') for seven HFs and one HTPF tests. Time is in seconds from the start time indicated in the first line.

#### CoordinateSBH3.dat

Coordinates of SBH3 borehole (start and end points) as well as of the intervals of tests HF1-HF3 (start and end points).

#### CoordinateSBH4.dat

Coordinates of SBH4 borehole (start and end points) as well as of the intervals of tests HF4-HF8 (start and end points).