Dataset repository for [*submitted to 03/2020*] Journal of Geophysical Research: Solid Earth regarding the manuscript entitled:

"***Modelling precursory laboratory seismicity using a roughness-based rate-and state-dependent friction model***"

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Figure 1 a, b, e

- **Data type**: Graphical (uploaded FIG1.pdf)
- **Data origin**:
    - a) adapted from Selvadurai and Glaser (2015b)
    - b) adapted from Selvadurai and Glaser (2017)
    - e) adapted from Selvadurai (2019)
- **Format of raw data** N/A
- **Format of curated data**
- **Estimation of volume of raw and curated data:** (1.1 Mb)

Figure 1f, 2

- **Data type**: Processed Data
- **Data origin**: Surface roughness measurement from the Nanovea P50
- **Format of curated data MATLAB**
- **Estimation of volume of raw and curated data:**
    - FIG1_f.mat (14.7 Mb)

Variable.	**Description**	**Size**	**Units**
x	x-axis	1 x 2501	mm
y	y-axis	1 x 852	mm
K1	Roughness	852 x 2501	µm

Figure 2c

- **Data type**: Processed data
    - **Data origin**: Surface roughness measurements from ADE MicroXAM-100
- **Format of curated data MATLAB**
- **Estimation of volume of raw and curated data:**
    - FIG2_c.mat (2.62 Mb)

Variable.	**Description**	**Size**	**Units**
x	x-axis	1 x 748	mm
y	y-axis	1 x 480	mm
data	Roughness	480 x 748	µm

Figure 3

- **Data type**: Processed Data
- **Data origin**: Surface roughness transect at y = 2mm from the Nanovea P50
- **Format of curated data MATLAB**
- **Estimation of volume of raw and curated data:**
    - FIG3_a.mat (0.03 Mb)

Variable.	**Description**	**Size**	**Units**
x_new	x-axis	1 x 2501	mm
Original	Roughness	1 x 2501	µm

    - FIG3_c.mat (used to make all SF for the cutting-plane method)

Variable.	**Description**	**Size**	**Units**
x_new3	x-axis	1 x 2501	mm
SF8192	O20 SF model	1 x 2501	[.]

Figure 4

- **Data type**: Graphical (uploaded FIG4.pdf)
- **Data origin**:
    - a) Can be derived from equations (9) and (11)
    - b) Adapted from Selvadurai and Glaser (2017)

Figure 5 + 6 + 7 + 8 + 9 +10 + 11 +12 + 13a,b

- **Data type**: QDYN simulation results can be used to replicate Figure 5 to 13b
    - **Format of raw data** MATLAB. All data is in the format given in format described in v1.1 Quasi-DYNamic earthquake simulator (ydluo.github.io/qdyn/).
    - Datasets are given in MATLAB structures:
        - 4.2 Simulation parameters structure (p)
        - 4.3 Output structures (ot, ox)
- **Estimation of volume of raw and curated data:**
    - *O10 D_c-model (QDYN_O10_600s.mat) (744 Mb)*
    - *O15 D_c-model (QDYN_O15_600s.mat) (903 Mb)*
    - *O17.5 D_c-model (QDYN_O17_5_600s.mat) (1260 Mb)*
    - *O18.5 D_c-model (QDYN_O18_5_600s.mat) (1280 Mb)*
    - *O20 D_c-model (QDYN_O20_600s.mat) (841 Mb)*
    - *O20C Composite-model (QDYN_O20C_600s.mat) (3270 Mb)*

Figure 13c, d, e

- **Data type**: Graphically adapted from previous publication
- **Data origin**:
    - Adapted from Selvadurai and Glaser (2015b)