Explanations for the available datasets (http://doi.org/10.5880/GFZ.4.1.2016.002)

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These datasets are supplementary material to
Klinkmüller, Matthias; Schreurs, Guido; Rosenau, Matthias; Kemnitz, Helga (2016): Properties of granular analogue materials: A community wide survey. Tectonophysics, http://doi.org/10.1016/j.tecto.2016.01.017

This dataset provides friction data from ring shear test on natural and artificial granular materials used for experimental simulation by the analogue geodynamic modelling community (21 sands and glass beads). The material samples have been collected community-wide and analysed at GFZ Potsdam in the framework of the GeoMod2008 conference benchmark initiative. The context of data collection, details of the material samples and measuring techniques as well as interpretation and discussion of results can be found in Klinkmüller et al. (2016) to which this dataset is supplement material.

The data presented here are derived by ring shear testing using a SCHULZE RST-01.pc (Schulze, 2004). Each sample has been carefully prepared by the same person and measured consistently following the same protocol. Preparation included sieving at 250 ml/min from 30 cm height into the shear cell. Measurements have been done at normal loads (normal stress) of 430, 860, 1290, 1720, and 2150 Pa and shear velocity of 3 mm/min typical of experimental conditions. Laboratory conditions were air conditioned during all the measurements (Temperature: 23°C, Humidity: 45%). The measurements presented here correspond to internal friction, shearing inside the material. Data for so-called basal or wall friction, i.e. shearing against a fixed plate, are available on request.

The resulting **shear stress curves** are presented at 5 Hz frequency and the Unit of Pa. From the shear stress curves the **friction data**, i.e. peak, dynamic and reactivation friction, have been picked manually and are presented as data pairs (normal stress & respective shear strength). Matlab-based regression analysis of these friction data by means of (a) multilinear regression of all data pairs and (b) mutual regression of two data pairs constrains the material shear failure envelope characterized by friction coefficient (slope of regression line) and cohesion (y-axis intercept of regression line). The results are presented by **friction plots**.

Each material sample corresponds to three files: shear stress curves (xls/txt format), friction data (txt format), friction plots (pdf format), examples of which are shown below. An overview of all files of the data set is given in the table **RSTDataOverview.**

***Example of data file type shear stress curve**: first line = test/signal-ID, second line = normal stress, third line = header for time-series data in rows below*

GFZ-Test-ID:	153-01-	1	2	3
Normal stress (Pa)	:	430	860	1290
Time (s)	Distance (mm)	Shear load (Pa)	Shear load (Pa)	Shear load (Pa)
0	0,00	4	18	73
0,2	0,01	4	19	73
0,4	0,02	3	20	73
0,6	0,03	3	22	73
0,8	0,04	3	34	73
1	0,05	3	73	74
1,2	0,06	3	86	82

***Example of data file type friction data**: first line = header for data pairs in lines below, first row = normal stress, second row = corresponding shear stress*

%Normal stress (Pa)	Shear strength (Pa)
430.00	309.65
860.00	588.55
1290.00	830.39
1720.00	1076.44
2150.00	1315.49
430.00	310.35
860.00	576.66
1290.00	838.08
1720.00	1077.14
2150.00	1337.86
430.00	313.84
860.00	584.35
1290.00	833.89
1720.00	1069.45
2150.00	1314.09

***Example of data file type friction plot**: upper panel = Plot and regression line of all data pairs in the Mohr space (regression result using Matlab multilinear regression function), lower panel = histograms of mutual two-point regression results for slope (friction coefficient) and y-axis intercept (cohesion).*