November 30, 2023

Data files for "Effect of Melt on Polycrystal Anelasticity" by Yamauchi and Takei submitted to JGR Solid Earth

Eight files are published here. They are all MATLAB files.

anela50.mat; anela41.mat; anela42.mat; anela44.mat

These data files provide the anelasticity data of present sample #50 and three previous samples #41, #42, and #44 (Yamauchi & Takei, 2016, JGR Solid Earth, doi:10.1002/2016JB013316).

In the field "anela##.run(i)", where ## = sample number, the data of the *i*-th run for sample ## are provided. "anela##.run(i).T" is the run temperature T (in °C) of the *i*-th run, which is identical with the run temperature of the subsequent creep test (c.f. Table 2 of the present paper for sample #50 and Table 2 of Yamauchi & Takei (2016) for samples #41, #42, and #44). "anela##.run(i).data" provides the anelasticity data of the *i*-th run, where the first, second, third, fourth, and fifth columns are frequency f (Hz), normalized frequency f/f_M, Young's modulus E (GPa), normalized Young's modulus E/E_U, and attenuation Q^{-1}, respectively.

<Note> Among several ~23°C runs of each sample, anela50.run(5) of sample #50 (1st T-cycle), anela50.run(14) of sample #50 (2nd T-cycle), anela41.run(11) of sample #41, anela42.run(1) of sample #42, and anela44.run(1) of sample #44 were used for the data fitting in Section 4.1 of the present paper. For sample #41, two 23°C runs were performed successively at the beginning to confirm the reproducibility. Among these two ~23°C runs, the data from the first 23°C run [anela41.run(1).data] are shown in Yamauchi & Takei (2016) (e.g., green circular symbols in Figures 10a and 10b). The data from the last 23°C run [anela41.run(11).data] are shown in Takei (2022) (e.g., green dotted lines in Figures 9a and 9b).

visco50.mat

This file provides the viscosity data of sample #50. The first and the second columns show the run temperature T (in °C) and viscosity η (in Pas), respectively. Corresponding to Table 2 in the present paper, the viscosity values are listed in the order of the measurements. However, the estimated viscosity values shown in parentheses in Table 2 (at 13.6°C, 9.3°C, and 9.2°C) are not included in this data file.

ultrah21.mat

This file provides the ultrasonic data of the present sample #h21. In the field "ultrah21.velocity", the first, second, third, fourth, and fifth columns are temperature T (in °C), V_P (km/s), V_S (km/s), V_P/V_P^0, and V_S/V_S^0, respectively, where V_P^0 and V_S^0 are the ultrasonic velocities of pure borneol sample. In the field "ultrah21.Q", the first and second columns are temperature T (in °C) and Q_S, respectively.

ultraYT2016super.mat

This file provides the ultrasonic data of the three partially molten samples #h10, #42, and #h12 from Yamauchi & Takei (2016). The first, second, third, fourth, and fifth columns are temperature T (in °C), melt fraction ϕ, Q_S, V_P/V_P^0, and V_S/V_S^0, respectively.

wetness.mat

This file provides the data of local melt fraction and wetness measured by the image analysis. The first and the second columns show local melt fraction ϕ_{local} and wetness ψ, respectively.