

**Viscous anisotropy of textured olivine aggregates, Part 2: Micromechanical model**

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**Additional Supporting Information (Files uploaded separately)**

Captions for Movie S1 and Movie S2

**Introduction**

This supporting information provides additional context for supplementary Movie S1 and Movie S2.

**Movie S1.** Animation of observed and simulated texture evolution initially presented in Figure 6. (top) Observed textures from PT0718, which was deformed in extension prior to deformation in torsion. (bottom) Simulated textural evolution calculated using as an input the texture from the lowest-strain portion of sample PT0718. Simulated data are calculated at increments of 0.1 shear strain. Individual points indicate grain orientations, and the color scale refers to the value of the orientation distribution function at that orientation.

**Movie S2.** Animation of textures simulated by our model, D-Rex, and VPSC for the torsion-post-extension deformation path. The initial texture was taken to be PT0750c. Pole figures were calculated with MTEX with a 10 degree halfwidth and a global color scale set to a maximum of 10 multiples of uniform distribution. Data are calculated at increments of 0.1 shear strain.