

Supplementary Materials

Strain-Induced Fabric Transition of Chlorite and Implications for Seismic Anisotropy in Subduction Zones

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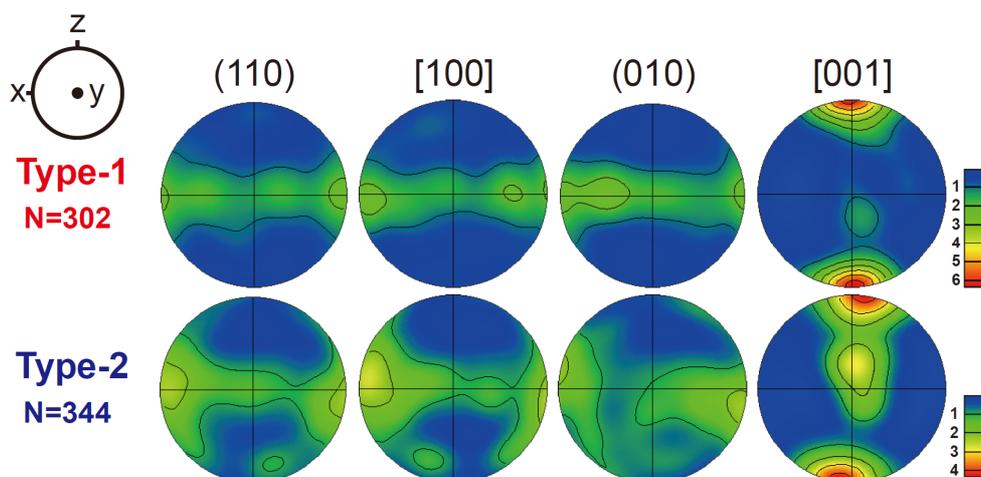


Figure S1. Pole figures of chlorite observed in natural samples showing two different types of LPOs [1]. Pole figures are presented in the lower hemisphere using an equal-area projection. N represents the number of grains, and a half-scatter width of 30° was used for the contours. The rounded contours in the pole figure represent the multiples of uniform distributions (m.u.d.), showing a fabric strength. x: lineation direction; z: direction normal to the foliation.

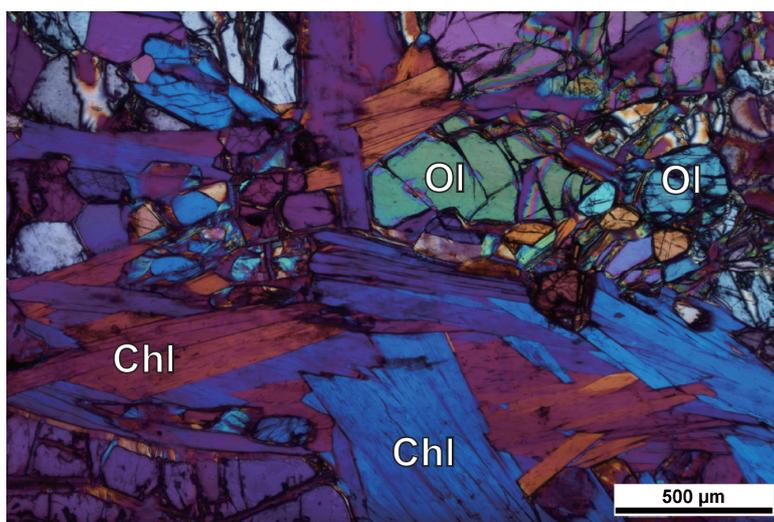


Figure S2. Optical photomicrograph of starting material (chlorite peridotite) in cross-polarized light with λ plate inserted. Natural chlorite peridotite from Almklovdalen, southwest Norway (sample 436 of Kim and Jung [1]) was used for the experiments in this study. Chl: chlorite; Ol: olivine.

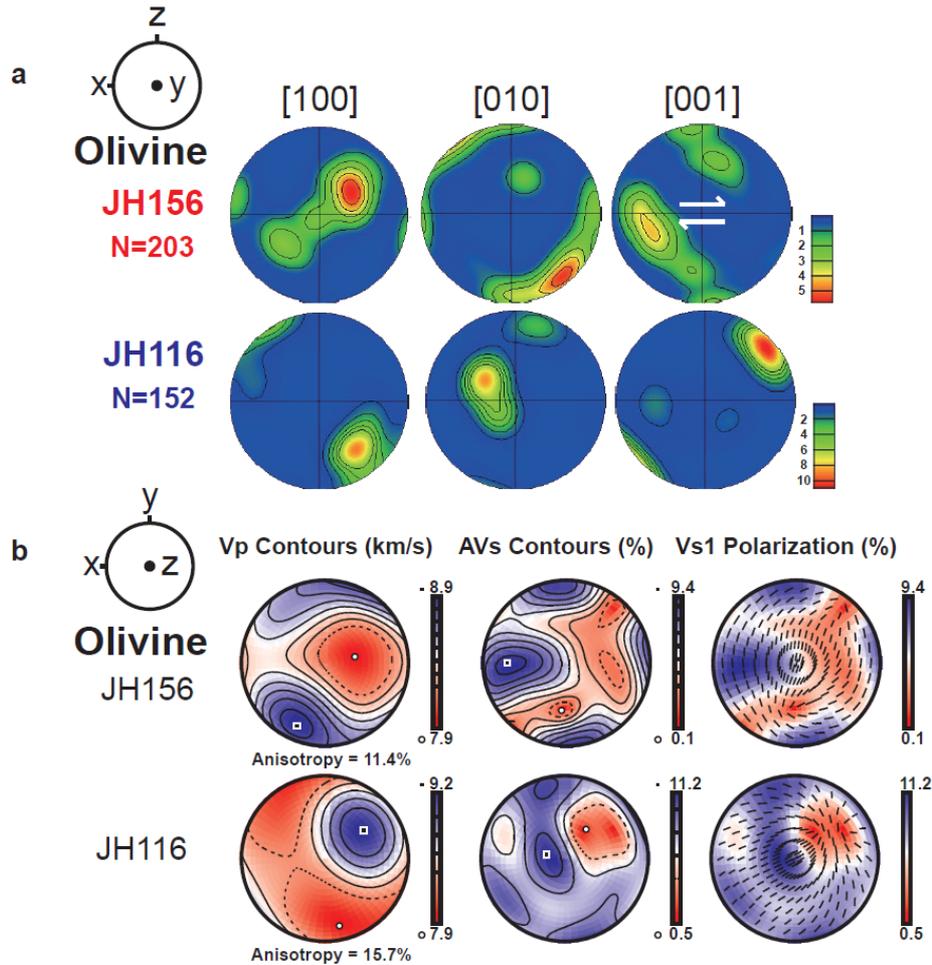


Figure S3. Pole figures and seismic anisotropy of experimentally deformed olivine. **(a)** Pole figures of olivine are presented in the lower hemisphere using an equal-area projection. White arrows indicate the dextral direction of shear. Sample JH156 shows a B-type LPO of olivine [2]. N represents the number of grains, and a half-scatter width of 30° was used for the contours. The rounded contours in the pole figure represent the multiples of uniform distributions (m.u.d.), showing a fabric strength. **(b)** Seismic velocity and anisotropy calculated from the LPO of olivine are presented in the lower hemisphere using an equal-area projection. The P-wave velocity (V_p), amplitude of the S-wave anisotropy (AVs), and the polarization of the fast S-wave (V_{s1}) are plotted. The polarization direction of the vertically propagating fast S-wave (V_{s1}) is shown as bars at the center of the stereonet. x: shear direction; z: direction normal to the shear plane.

References

1. Kim, D.; Jung, H. Deformation microstructures of olivine and chlorite in chlorite peridotites from Almklovdaalen in the Western Gneiss Region, southwest Norway, and implications for seismic anisotropy. *Int. Geol. Rev.* **2015**, *57*, 650–668.
2. Jung, H.; Karato, S.-I. Water-induced fabric transitions in olivine. *Science* **2001**, *293*, 1460–1463.