

Poster presentation | S3: Rheology and Material Transfer in Mantle and Crust (Special Session)

Sat. Sep 26, 2026 12:30 PM - 2:00 PM JST | Sat. Sep 26, 2026 3:30 AM - 5:00 AM UTC | Poster (336, 340, 341)

**S3: Rheology and Material Transfer in Mantle and Crust (Special Session)**

## ◆ Student Presentation Award Entry

12:30 PM - 2:00 PM JST | 3:30 AM - 5:00 AM UTC

**[S3P-02] Microstructural evolution of antigorite serpentinite during progressive deformation in the Sasaguri area, Renge Belt, Fukuoka Prefecture**

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Keywords : Serpentinite, Antigorite, Mylonitization, Deformation mechanisms, EBSD

Antigorite is the stable serpentine polymorph under mantle wedge conditions and plays a key role in accommodating deformation within subduction-zone serpentinite. This study aims to clarify the microstructural evolution of antigorite during progressive deformation and to identify the deformation mechanisms responsible for mylonitization and grain-size reduction in antigorite serpentinite. The study area is located in the Renge Belt, north of Narubuchi Dam in the Sasaguri area, Fukuoka Prefecture. Field surveys were conducted on antigorite serpentinite outcrops extending over an area approximately 500 m north of Narubuchi Dam. The antigorite serpentinite consists predominantly of antigorite with minor amounts of carbonate, magnetite, chlorite, talc, and Cr-spinel. The antigorite serpentinite in the study area has undergone only weak plastic deformation, except for a localized mylonite zone approximately 1–2 m wide that occurs about 100 m north of the southern boundary of the serpentinite body. In weakly deformed antigorite serpentinite, antigorite occurs as coarse grains up to several millimetres in size. These grains commonly exhibit undulose extinction, kink bands, and abundant subgrain boundaries. Some subgrain boundaries are closely spaced, forming subparallel arrays parallel to the (001) cleavage plane of antigorite. The strike and dip of the foliation plane of the mylonite zone are N80°E and 76°N, respectively. The antigorite grains constituting the mylonitic zone are less than 200  $\mu\text{m}$  in size and exhibit a strong antigorite shape-preferred orientation. The foliation is defined by a fine-grained antigorite matrix, whereas relatively coarse-grained, lenticular antigorite aggregates are commonly observed. Based on the grain size of their constituent antigorite grains, these aggregates are classified into two types: large and small lenses. Large lenses are generally more than 2 mm long and contain antigorite grains up to 300  $\mu\text{m}$  in size that exhibit weak undulose extinction. In contrast, small lenses are generally less than 1 mm long and consist of finer antigorite grains showing stronger undulose extinction. Most lenses are aligned parallel to the foliation, although some are locally rotated. Preliminary EBSD analyses of mylonitic antigorite indicate that the (001) plane is preferentially aligned parallel to the foliation, whereas the [010] direction is preferentially aligned parallel to lineation. Ongoing EBSD analyses combined with detailed microstructural observations using polarizing microscopy and SEM will further constrain the deformation mechanisms responsible for mylonitization and grain-size reduction of antigorite serpentinite.