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Formation process of slickenside developed on the Glarus thrust

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We observe microstructures of slickenside developed on the Glarus thrust to clarify its formation process mainly with optical and electron microscopy. Glarus thrust is one of the biggest faults in the world, whose lateral displacement is about 30-40 km. We collected the fallen Lochseiten limestone at Linthal, Swiss. The sharp slickenside is developed in our sample.

The summary of our microstructural observations is the followings. 1) The slickenside was generated during faulting, which was accompanied with brittle deformation of limestone. The brittle deformation occurred at the area only within ca. 1 cm distance from slickenside. 2) The fine calcite grains with several um in size occupy at the area away from the above. These grains were deformed by dislocation creep. And they make a strong lattice preferred orientation created under dextral shear stress condition. The shear direction is absolutely parallel to striation on the slickenside. These results suggest strongly that the Lochseiten limestone were deformed by both of plastic and brittle manners at the same stress condition. Now, we observe the microstructure of the slickenside surface to clarify its formation mechanism.

Keywords: slickenside, faulting, microstructure, Glarus thrust