

野母半島長崎変成岩類における蛇紋岩メランジュ構成岩類の産状と摩擦特性

Occurrences and frictional properties of serpentinite mélange rocks in the Nagasaki metamorphic rocks, Nomo peninsula, Japan

*田畑 論太郎¹、内田 想¹、平内 健一¹

*Rontaro Tabata¹, Kokoro Uchida¹, Ken-ichi Hirauchi¹

1. 静岡大学理学部地球科学科

1. Department of Geosciences, Faculty of science, Shizuoka University

To understand effects of metasomatic alteration on deformation processes and rheology of slab-mantle interface zones, we conducted frictional sliding experiments on serpentinite mélange rocks and surrounding basic and pelitic schists and antigorite serpentinite, located in the Nagasaki metamorphic rocks, Nomo peninsula, southwestern Japan. The serpentinite mélange is distributed between antigorite serpentinite and basic and pelitic schists, and is composed mainly of albitized basic schist. Within the albitized basic schist, Ca-amphibole (tremolite or actinolite) schist occurs as highly deformed zones. Furthermore, albitite mylonite that is in fault contact with antigorite serpentinite experienced grain size reduction via dynamic recrystallization. These results indicate that shear localization occurred by Ca- and Na-metasomatism in the serpentinite mélange. The frictional experiments were carried out at room temperature, normal stress of 1 to 10 MPa, and sliding velocities of 0.66 or 2 $\mu\text{m/s}$. The internal coefficients of friction for all rocks range from 0.58 to 0.71, consistent with the prediction from the Byerlee's law. The velocity dependence of friction ($a-b$) for all rocks range from -0.004 to 0.003. Pelitic schist shows velocity strengthening behavior, while albitite, Ca-amphibole and basic schists, and antigorite serpentinite were both velocity weakening and velocity strengthening. These results indicate that serpentinite mélange zone along the slab-mantle interface represents frictionally complex fault zones.