



Structures and formative processes of non-tectonic faults in pelitic schist

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Non-tectonic faults are commonly formed by mass movements but their structures and formative processes have been scarcely studied in spite of their importance in slope development and slope stability. If a fault has a non-tectonic origin and is a sliding surface of a landslide, the slope with this fault may be gravitationally unstable, but if it has a tectonic origin it might not be.

We observed and analyzed non-tectonic faults in pelitic schist by using high-quality drilled cores obtained from a landslide area with the stiff-foam drilling technique. These cores were essentially continuous ones not being separated into pieces even though they had many fractures in them. We analyzed the structure of the cores with X-ray CT scan and observed the cross sections of paraffin-impregnated samples, and measured hardness and color continuously along the cores to detect local variations in rock properties. X-ray CT images clearly showed the structure of non-tectonic faults, from which we can read the various developing stages of the faults. Non-tectonic faults have a shear zone, which is bounded by a smooth shear surface if it is along the schistosity and by a jagged surface if it crosses the schistosity. From the hanging wall or footwall into the shear zone, we observe a schistosity-parallel shear surface, shear lenses, jigsaw-puzzled fragments, and rock fragments floated in a gouge. Schistosity-parallel shear surface may nucleate in a pelitic layer that is rich in graphite and pyrite.