



## **Fault zone evolution in a Cenozoic inversion tectonic setting, SE Korea**

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The Korean peninsula has been considered as a tectonically safe region from earthquakes, because it is located in a stable margin of the Eurasian plate. However, more than 30 Quaternary faults have recently been reported from the southeastern part of the Korean peninsula. The studied fault zone is an N-S trending fault located in the northern extent of the Quaternary Eupcheon Fault, which composed of several fault gouges indicating multiple deformations. The fault zone (fault core) is exposed over 1 km long and the thickness is up to 2m. The fault gouge zone is composed of several different colored gouge bands.

Well-exposed vertical and horizontal sections are analyzed so as to understand the characteristics of the fault and fault zone evolution. The analyzed kinematic indicators such as cleavages, lineations and slickenlines suggest that the fault underwent early normal slip under SE extension and was later reactivated under NNW compression resulting in inversion tectonics. Major fault zones do not cross-cut each other; instead, the fault gouges within the fault zone split and merge into other fault zones.

Fault rocks developed in this fault zone show asymmetrical features including lens-shaped breccias blocks in gouge zones, and asymmetric distributions of grain size and fracture density, indicating mature fault system and asymmetric fault zone evolution. The hanging wall block of the fault shows relatively highly damaged fracture patterns indicating that the hanging wall is weaker than footwall. Therefore, detailed analysis of fault and fracture patterns, and characteristics of fault zones must be very useful in evaluation of fault zone evolution and characteristics of foundation.