



Deformation characteristics of the Ilgwang Fault in SE Korea

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The NNE-SSW trending Ilgwang Fault is one of the major structural features in southeast Korea. It is a high angle, right-lateral strike-slip fault with a displacement of about 1.2 km. The basement around the fault consists of Cretaceous sedimentary and volcanic rocks with younger igneous intrusions, forms part of the Gyeongsang Basin. It is important to understand the characteristics of the Ilgwang Fault, as it is located near nuclear facilities and large cities with tall buildings. In this study, we investigated exposures in new road-cut sections along the Busan-Ulsan Highway. The structural patterns analyzed show wide deformation zones and may indicate various multi-deformation events including reactivation of pre-existing faults. Based on kinematic analysis of faults, joints, and dykes, the deformation history was established in the study area. The angular change of the structural elements (e.g., beddings) is used here as an indicator of deformation intensity across the fault. The analysis shows that the deformation zone across the Ilgwang Fault spans about 200 m in volcanic rocks and 1 km in sedimentary rocks, indicating that the deformation is strongly localized in volcanic rocks and more diffused in sedimentary rocks. Numerical modeling supports the conclusion that sedimentary substrate has a wider deformation zone than do massive granitic or volcanic rocks, suggesting that material properties are one of the main factors controlling concentration of stress and possible resultant damage.