



## Did the Yangsan Fault in a stable continent region move continuously during the Holocene?

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The Korean Peninsula is more than 400 km away from passive plate margins and considered a stable continent region. However, it has suffered from damaging earthquakes in the last 20 years. There are two major North–North East tectonic faults in the region: the Chugaryong fault running from Wonsan through Seoul to the west coast and the Yangsan fault in the southeastern part of the peninsula. The Yangsan fault extends for over 170 km and has been active since the late Cretaceous period. The fault has experienced many earthquakes in the last 2000 years, most recently Mw 5.5 earthquake in its vicinity without any surface rupture. The fault has been studied by various disciplines, such as structural geology to determine the characteristics of the fault, geophysical exploration to determine the extension of the fault, and mineralogy to analyze fault gouges.[A1] However, the last fault movement remains unknown. Trench studies on the Yangsan Fault undertaken in the central south of the Yangsan Fault to obtain its last movement revealed that the fault had been reactivated at least twice during the Holocene period, at approximately 2 ka and 4 ka. Before the Holocene, another fault movement occurred at approximately 50 ka, with a strike-slip motion creating a meter-wide fault damage zone. LIDAR and aerial photographs demonstrated that a higher terrace younger than 320 ka had moved by 1.5 km with a left-lateral-strike-slip motion. We now surmise that the Yangsan Fault has been continuously reactivated for more than 60 million years, and could potentially generate severe geohazards in the near future. Furthermore, even if the fault is inside an intraplate, we propose that it has continuously been reactivated from the Late Cretaceous to the present by plate tectonics.