Preliminary results of earthquake geology for the Southern Yangsan Fault, Korea

Jin-Hyuck Choi (cjh9521@kigam.re.kr)

Geology Division, Korea Institute of Geoscience and Mineral Resources

The Yangsan Fault, one of major structures in Korean Peninsula, is at least about 180-km-long on land, with a finite right-lateral offset inferred to be more than 20 km. In the last 25 years, Quaternary earthquakes have been recognized at 21 sites along the Yangsan Fault. The 2016 M_W 5.5 Gyeongju earthquake, which has occurred around the Yangsan Fault, recorded the largest instrumental earthquake ever in Korea even though it does not involve surface deformations. Therefore, to explore the location, timing, and size of large paleo-earthquakes along the Yangsan Fault is the most essential work to examine characteristics of future large earthquakes in Korea, and hence to facilitate seismic hazard assessment and loss mitigation.

Using high-resolution airborne LiDAR images, the Southern Yangsan Fault have been traced based on the geomorphic features. Linear geomorphic markers, such as ridge, gully, and river terrace, perpendicular to the fault indicate that cumulative horizontal offsets. At a targeted area, dating materials for OSL and C14 analysis were collected to estimated ages of geomorphic markers. In the field, it was able to observe unconsolidated sediments were cut by faults in outcrop sections. At some locations, high-resolution geophysical surveys were performed across the inferred lineaments to trace the buried fault. Also, stratigraphic records of paleo-earthquakes were identified on trench walls. Here I introduce the preliminary results of these analysis and discuss research strategies for further active fault researches in Korea.