

Preliminary study on related faults and triggering mechanism of the 9.12 Gyeongju earthquake (ML=5.8)

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The 9.12 Gyeongju Earthquake (ML=5.8), the biggest instrumental earthquake in South Korea, are followed by hundreds of small to medium magnitude of aftershocks around the Hwagok reservoir in Naenam-myeon, Gyeongju, Korea. This earthquake is a shock to Korean people who believed that a Korean peninsula is a safe place from earthquakes. It was enough people to think the importance of earthquake and active fault. One of the hottest issues after the earthquake is the related active fault. We directly visited the epicenter area and carried out field work to find surface ruptures or any related faults, and furthermore, we have done lineament analysis based on pre-existing satellite images and new LiDAR data as well as fore/aftershocks distribution. Although we could not find any surface ruptures related to this earthquake, there are many N-S to NNE-SSW trending lineaments and minor dextral faults, which are parallel to the main Yangsan Fault and a subsidiary Deokcheon fault. The two major faults are geometrically linked by several NE-SW trending connecting lineaments in LiDAR Image. Focal mechanisms of the 9.12 Gyeongju Earthquake represent NNE trending dextral strike-slip fault, and distributions of fore/aftershocks indicate the concentration in the linking damage zone between the two major faults. Based on these preliminary studies, the 9.12 Gyeongju Earthquake may be triggered by a connecting fault in the linking damage zone of the two NNE-SSW trending faults (Yangsan fault and Deokcheon fault) with a dextral strike-slip sense.

Keywords: Gyeongju Earthquake, Active fault, Earthquake mechanism, LiDAR, Aftershock distribution, Fault damage zone



