Seismic site response of tephra slope: a case study for the landslides triggered by the 2018 Hokkaido Eastern Iburi Earthquake

*Gonghui Wang[1], Ning Ma[2], Issei Doi[1], Gen Furuya[3], Naoki Watanabe[4], Satoshi Ishimaru[5], Hiromichi Koyasu[5]

1. Kyoto University, 2. Southwest Jiaotong University, 3. Toyama Prefectural University, 4. Niigata University, 5. Hokkaido Research Organization

During the 2018 Hokkaido Eastern Iburi Earthquake, a huge number of landslides were triggered on the tephra slopes, resulting in great damage to local properties and 36 casualties. Although one large landslide was initiated with its sliding surface being in the bedrock of sandstone and siltstone, most of them occurred on the tephra slope. To understand the initiation and movement mechanisms of these landslides occurring on tephra slopes, understanding the coseismic response of the slopes during the earthquake is of great importance. To achieve this, we conducted microtremor observation on the tephra slopes on Yoshino and Tomisato areas, Atsuma immediately after the earthquake. We also installed seismometers on the tephra slope near the Yoshino area and performed continuous earthquake observation. Through analyzing the observed results and comparing them with those recorded in some earthquake observation stations during the mainshock, we examined the site response features of these tephra slopes and then the possible initiation mechanism of these tephra landslides during the earthquake.

Keywords: 2018 Hokkaido Eastern Iburi Earthquake, Seismic site response, Tephra slope, landslide

