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Debris avalanches of pyroclastic fall deposits induced by the 1949 Imaichi earthquake

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Debris avalanches of pyroclastic fall deposits have been frequently induced by earthquakes in circum pacific countries, causing severe damage. Recent earthquakes that induced that type of landslides are 2011 Tohoku earthquake, 1984 Naganoken Seibu earthquake, 1978 Izu-Oshima-Kinkai earthquake, 1969 Tokachi-Oki earthquake, and 1949 Imaichi earthquake, in which landslides induced by the 1949 Imaichi have much less record than the others. Landslides induced by the 1949 Imaichi earthquake with a magnitude of 6.4 has been reported to have induced numerous numbers of landslides by Morimoto (1951) but their distribution has not been well plotted on a map and the slid materials are not well specified. We surveyed the affected area using high-resolution DEMs obtained by the airborne LiDAR and made field surveys. Comparison between the high-resolution DEMs and local landslide distribution maps showed that there are two types of landslide, one is a deep landslide with a sliding surface along the Kanuma Pumice Fall Deposot in a depth of 5-6 m and the other is a shallow landslide with a sliding surface probably along the base of the Imaichi Pumice Fall Deposit in a depth of 2-3 m. The deep landslides are rather easy to identify using high-resolution DEMs, and in addition to the 1949 landslides, we identified older deep landslides, which are assumed to have sliding surfaces in the same horizon with the 1949 landslides. Topographic features of shallow landslides may be erased fast, so we suppose older landslides cannot be identified on high-resolution DEM images.

Keywords: earthquake, landslide, tephra, pumice