[JJ] Evening Poster | H (Human Geosciences) | H-DS Disaster geosciences

[H-DS11]Geohazards in humid, tectonically active countries and their precursors

convener:Masahiro Chigira(Disaster Prevention Research Institute, Kyoto University), Satoru Kojima(Department of Civil Engineering, Gifu University), Hiroshi YAGI(山形大学地域教育文化学部, 共同), Taro Uchida(National Institute for Land and Infrastructure Management)
Tue. May 22, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)
This session covers mass movements of landslide, slope failure, debris flow, and gravitational slope deformation in tectonically active, humid countries, and aims to discuss on their mechanisms, characteristics of occurrence sites, the significance in geological time scale, and the methodology to mitigate their affects by researchers with various related research fields.

[HDS11-P06]Gravitational slope deformation and its transformation into catastrophic landslides during earthquakes in a slate area

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Japan is now expecting next gigantic earthquakes in Tokai and Tonankai regions along the Nankai trough, which earthquakes likely induce catastrophic landslides. In order to mitigate landslide disaster, clarifying the occurrence mechanism and predicting the potential locations of landslides are essentially important. The purpose of study is to characterize the geomorphological and geological features of gravitational slope deformation of slate in the southern Akaishi Mountains, and to understand the mechanism of their transformation into catastrophic failure during earthquakes based on historic records of landslides.

The study area is the Abe River catchment, where slate of the Paleogene Setogawa Group is distributed and a large landslide, Oya kuzure, was induced by the 1707 Hoei Earthquake, one of the largest earthquakes in Japan. Also during the 1854 Ansei Tokai Earthquake, many landslides were induced and landslide dams were made, which were recorded on a map.

The slate in the study area has well developed cleavage, and commonly toppled or buckled in a flexural manner near the slope surface. Such deformations appear on slope surfaces as linear depressions, convex bulge, and down-hill facing scarps. In particular, large scale linear depressions aligned parallel to ridge tops are inferred to have been developed by shearing along a wide crush zone of faults during toppling. A crush zone is generally impermeable across it, so the deformed rock mass may be affected not only by earthquakes but also by heavy rainstorms. On the other hand, the gravitationally deformed rocks without it have many openings and highly permeable, so they are vulnerable to earthquake shaking rather than rainstorms. Gravitational buckling deformation is also susceptible to earthquake shaking.