



Coupled finite element and discrete element approach for reconstructing the Aso-bridge co-seismic landslide

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This study presents an investigation of the Aso-bridge landslide subjected to the 2016 Kumamoto earthquakes via a coupled approach of finite element analysis (FEA) and discrete element analysis (DEA). The Aso-Bridge landslide occurred in the west of the caldera of Aso Volcano, near the Aso Bridge of National Road 57 across the Kurokawa River. Field investigations, factor of safety studies, and finite element analyses relating the event are available from previous works (1-3). Although the failure surfaces and likely initiation times have been previously evaluated, the entire landslide process can still be explored by the proposed method. Noting that the sliding velocity at failure can be estimated by FEA and linked to DEA, the runout behavior may be more closed to the reality. The study has demonstrated the potential of using the coupled approach to realistically reconstructing the complete earthquake-induced landslides, covering the sliding transition from a small deformation to a large dislocation.

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