



A debris avalanche at Süphan stratovolcano (Turkey) and implications for hazard evaluation

Yavuz Özdemir (1), İsmail Akkaya (2), Vural Oyan (3), and Nilgün Güleç (4)

(1) Department of Geological Engineering, Yüzüncü Yıl University, Van, Turkey, (2) Department of Geophysical Engineering, Yüzüncü Yıl University, Van, Turkey, (3) Department of Mining Engineering, Yüzüncü Yıl University, Van, Turkey, (4) Department of Geological Engineering, Middle East Technical University, Ankara, Turkey

Volcanic debris avalanches result from catastrophic collapse of flanks of volcanic edifices. They are common events in the history of a volcano. In a few minutes, they can fill and change the surrounding landscape and cover extensive areas. The most tremendous Quaternary volcanoes of Turkey are situated at Eastern Anatolia. These dormant/active volcanoes represent significant threat to the surrounding populations. The reactivation and/or partly collapse of such a volcano in Eastern Anatolia can result catastrophic consequences due to the dearth of previous studies, hazard maps, emergency information programs.

Süphan stratovolcano is one of the most important members of the Quaternary aged volcanic center in the region with its steep slopes and higher elevation reaches up to 4050m above sea level. It includes lava flows, lava domes, pyroclastic rocks, debris avalanche, maar related pyroclastic fall and flows. This study concerned with a debris avalanche which identified at the northern parts of the volcano. Süphan debris avalanche displays hummocky topography and appears to have traveled approximately 25-30 km away from the source at the northern parts of the volcano. The products of Süphan debris avalanche are characterized by two different facies, block and matrix and are overlain by younger deposits of the volcanism. There is no hazard assessment have been done so far about this volcano. There are lots of towns with a remarkable population present around the Süphan volcano. In this study we performed a series of debris avalanche flow simulations with a numerical code called VolcFlow to evaluate the possible future collapses and impact areas.

Keywords: Süphan Stratovolcano, Eastern Anatolia, Debris avalanche, VolcFlow