

Dry and wet debris avalanche deposits at Mt Meru volcano, Tanzania.

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Mt Meru volcano is located in the Northern Tanzanian Divergence Zone where the East African rift splits into several branches. This 4565 m-high stratovolcano overlooks the highly populated city of Arusha. The edifice is breached on the east side by a 4x5 km horse-shoe shaped valley that was attributed to landslides associated with lahars deposits (Wilkinson et al., 1986; Dawson, 2008) and a major collapse dated at 7800BP (Wilkinson et al., 1986; Roberts, 2002; Dawson, 2008). An ash cone has grown up within the collapse scar, with its last eruption occurring in 1910.

Although Meru major scar has been identified, boundary and characteristics of the deposit remain poorly known as most studies have been based on remote sensing mapping and limited field observation. In this study we combine remote sensing with detailed field mapping. We identify a dry and a wet debris avalanche units originating from the large east scar and from a buried NE scar respectively. The wet debris avalanche travelled first as a dry avalanche that turn into a debris flow while entering in a river. As a consequence, its inertia increased and the debris flow was able to climb or even splash over topographic highs such as cinder cones. The dry avalanche -i.e. debris avalanche s.s.- might have a lower inertia compared to the debris flow, but its energy was enough to travel far away from the source. The debris avalanche has been deviated to the south by Kilimanjaro and Ngordoto volcanoes.