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Slope instability monitoring of volcanic terrains at S. Miguel Island (Azores): preliminary results

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The Azores archipelago is located in the North Atlantic Ocean and it is composed by nine volcanic islands. S. Miguel is the largest one and during its five hundred years of history has been affected by several destructive landslides triggered either by earthquakes, volcanic eruptions and heavy rainfall episodes.

Povoação County is located in the southeast part of the island and presents natural conditions (geology, lithology, geomorphology, tectonics, climate, hydrography, hidrology and vegetation) that are rather unique leading to the occurrence of landslides.

With the main goal of detecting small soil movements that indicate instability in potential landslide areas, a monitoring program was established in Povoação village, using an Automatic Total Station. Two different slope areas were investigated: (1) a potential rock fall scarp composed by welded ignimbrite units, where an observation network of 12 benchmarks was implemented; and (2) a steep slope favourable to rotational/translational slides, formed by pumice deposits, where 18 benchmarks were installed.

In this work, the data obtained during three campaigns carried out in 2004 are discussed and some recommendations are made taking into account the observed risk.