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Field testing of the AVTIS radarometer at Soufriere Hills and Arenal volcanoes

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AVTIS - the All weather Volcano Topography Imaging Sensor is designed to measure topography and surface temperature through cloud. We are currently testing its capabilities in the field. During May and June 2004 we deployed it on Soufrière Hills Volcano, Montserrat. The instrument can be carried and operated by two people and took fifty minutes to acquire a 20^o x 5^o scene at 0.1^o increments. During the fieldwork period the lava dome was not growing and only the radar mode was used. The data recorded indicate that the maximum distance imaged was about 3800 m. Combining datasets acquired from different viewpoints can potentially provide a full 3D topographic model. The accuracy and completeness of this reconstruction are reduced by two factors. Firstly, relatively small grazing angles of the ground-based line-of-sight rendered incised valleys invisible. Secondly, methods currently used to orient the instrument limit the accuracy of the resulting topographic information. Nevertheless, valuable information on new topographic surfaces was obtained in an area north of the lava dome where a valley has been infilled by deposits and in the amphitheatre created by the giant collapse event of July 2003. After further refinement of the instrument it will be deployed on Arenal Volcano, Costa Rica in 2005, to measure the dynamic target presented by the basaltic andesite lava flows which are effusing at a few tenths of a cubic metre per second.