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Seismic Tomography of the Soufriere of Guadeloupe upper geothermal system

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We present the result of an active seismic tomography experiment that has been conducted on the Soufriere of Guadeloupe, Lesser Antilles, in a joint project including several geophysical studies. The Soufriere Lava Dome constitutes the upper part of la Soufriere very active geothermal system that had its last phreatic eruption in 1976. The Soufriere volcano is known to have been the source of many instabilities leading to major flank collapses. The purpose of these geophysical experiments is then to bring better constraints on the possible zone of mechanical weakness. Three active seismic experiments have thus been conducted on the upper part of the volcano, in coordination with EM experiments in order to scan the same area. We show the results obtained by several profiles that are inverted using a travel-time tomography. The results show very good agreement with resistivity profiles. These results will be used in the future to conduct a joint inversion. In this presentation we focus on the major common features and on major seismic propagation observations.