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Continuous multi-component geophysical experiment on LUSI mud edifice: What can we learn from it?

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The Lusi eruption is located in East Java, Indonesia, and is ongoing since May 29th, 2006. In the framework of joined international projects, several joint geophysical studies focussing on seismic monitoring, spatial investigation over the mud edifice and its surroundings are being conducted. Here we present freshly acquired data from a test site to investigate: (1) potential change in the natural electrical self-potential generation over time (2) potential change in gravity field associated to change in mass or volume, (3) if the geysering activity generates disruption on either the electrical or gravity field.

We selected a location ∼200m to the NE of the active Lusi crater. The experiment site covers an area of 60m x 80m, crossing the boundaries between the soft and the solid walkable mud. The western edge of the study area was less than 100m away from the rim of the crater site.

A self-potential array made of 6 Pb-PbCl2 electrodes was deployed over the site. The electrodes were positioned inside active seeps, on dry unaltered zones and close to the mud stream that flushes the water erupted from the crater site. All the electrodes were connected to a single Pb-PbCl2 electrode reference.

A second array of 7 thermometers was installed positioning 5 of them next to SP electrodes, one to measure atmospheric temperature and another P/T probe to monitor the stream water.

In addition a seismometer coupled with a HD video camera, a thermal camera and a gravimeter recorded on site for several days monitoring visual and seismic activity of the crater.

The collected data allows us to 1) monitor and define the different geysering activities ongoing at the crater, 2) define the delay existing between the recorded seismicity and the visual observations, 3) verify if the crater activity triggers perturbations that are transmitted to e.g. the thousands of satellite seeps distributed in the 7 square kilometers zone inside the embankment; 4) how significant is the delay between the crater activity and the water streamed out.