



Imaging mud fluid conduits of the Gunshuiping mud volcano with Electric Resistivity Methods

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We conducted the resistivity survey at the Gunshuiping mud volcano and produced a 3D model in order to delineate the mud-fluid conduits in the mud volcano system. The Gunshuiping mud volcano is located in a 175-m × 90-m plateau in Southwest of Taiwan. There are three main mud-volcano craters [U+FF1A] craters 1, 2 and 3. Crater 3 is active and the others are inactive.

We conducted thirteen survey lines using the Wenner configuration to obtain the resistivity profile images. The lengths of the lines are about 155 m and 60 m, which can resolve the resistivity image down to 30 m and 10 m in depth, respectively.

The results appeared that there is a vertical structure under the crater 3, and we suggest that it is the mud-fluid conduit. There is a chamber at depth between 3 and 14 m, and we interpret it is the temporary storage of mud fluid during the erupting process. Beneath the craters 1 and 2, there is a near-surface, horizontal conduit connecting the craters 1 and 2. At depth between 15 and 25 m, the vertical conduit beneath the crater 3 and the horizontal conduit beneath the craters 1 and 2 are connected. The resistivity images clearly delineate the conduit underneath the craters and suggest that the crater 3 is the main erupting conduit, which is consistent with the surface features, in the Gunshuiping mud volcano system.