



Passive seismic monitoring studies at Tiris geothermal field in East Java, Indonesia

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The Tiris geothermal field (TGF) is indicated by the presence of two sets of surface warm springs located within the proximity of two volcanoes: Mt. Lamongan and Mt. Argopuro. Preliminary assessment of TGF in terms of petrology of the volcanic rock and geochemistry of springs has been studied by Deon et al. (2012). The combination of petrology and geochemistry studies suggests: 1) the relation between sea water and the origin of warm springs and 2) the existence of a concealed layer responsible for capturing H₂S gas which, in turn, accounts to the observed HCO₃⁻ excess of the springs.

In order to support hypotheses resulting from those petrology and geochemistry studies, two passive seismic field experiments have been deployed successively. The first small-scale seismic noise study in 2011 was carried out by setting up 5 geophones for 5-days monitoring positioned around Mt. Lamongan. The second larger-scale passive seismic study has been performed since October 2012 setting up 16 short period stations and 4 broad-band stations around TGF for 6 months monitoring period. The goal of preliminary seismic noise test in 2011 was to identify pre-dominant noise characteristics in the area, while passive seismic monitoring in 2012 attempts to reveal the underground geologic structure of TGF derived from seismic properties. We report the set-up of both experiments and describe first result of seismic noise analysis and preliminary monitoring analysis.

References

Deon, F.; Moeck, I.; Scheytt, T.; Jaya, M.S. (2012): Preliminary assessment of the geothermal system of the Tiris volcanic area, East Java, Indonesia. 74th EAGE Conference & Exhibition (Copenhagen, Denmark 2012).