

Ground deformation around Ohaaki geothermal field, New Zealand inferred from persistent scatterer SAR interferometry

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There are several producing geothermal fields in Taupo Volcanic Zone (TVZ), northeast-trending zone of mainly andesitic to rhyolitic arc/back arc volcanism, within the central North Island, New Zealand. It has been reported that ground subsidence with the rate of 30-50 mm/year has occurred at the Wairakei geothermal field, one of the biggest geothermal fields in TVZ [Allis et al., 2009]. Such a research on ground deformation around geothermal field is, however, rarely documented. Thus, it would be important to study deformation pattern at the geothermal field.

In this study, we mapped ground deformation around Ohaaki geothermal field located northeast of TVZ using persistent scatterer SAR interferometry (PS-InSAR). Since the analysis makes use of high quality phase information of the coherent target of SAR image, the estimated deformation is more accurate compared with the standard differential SAR interferometry (DInSAR). We processed 21 ALOS/PALSAR images acquired from January 2007 to January 2011 from an ascending orbit. As a result, we estimated ground deformation opposite to line of sight direction, which may correspond to ground subsidence. Moreover, the deformed area showed sharp boundary which we can be attributed to fault location in the area.

Allis, R., C. Bromley, and S. Currie, Update on subsidence at the Wairakei-Tauhara geothermal system, New Zealand, *Geothermics*, vol. 38, pp.169-180, 2009.

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