

Development of geothermal field following the 2000 eruption of Usu volcano as revealed by ground temperature, resistivity and self-potential variations

M. Saba, Y. Nishida, S. Takakura, N. Matsushima, T. Mogi

Abstract

The 2000 eruption of Usu volcano, NE Japan, took place on the foot of the somma, and formed a cryptodome of 65 m high accompanying numerous faults. We made repeated measurements of ground temperature, Self-Potential (SP) and electrical resistivity, in order to clarify the mechanism of development of the newly formed geothermal field on the fault zone. Prior to the expansion of the geothermal field, we detected a resistive zone at the center of the geothermal zone and it supposed to evidence that the zone involving dry steam phase had been formed beneath the fault zone. A rapid expansion of the geothermal field followed along the fault zone away from the craters. The place of maximum amplitude of the SP field also migrated following the expansion of the high ground temperature zone. The high resistive part has shrunk as a consequence of the progress of condensation to warm the surroundings. Based on the observations, we delineated the process of the hydrothermal circulation. Considering the topographic effect of the SP field observed on the highly permeable zone in the Usu somma, the potential flow along the slope of the soma was expected to play an important role to promote the rapid expansion of the geothermal field and the migration of the most active part.

Keywords

Usu volcano;geothermal field;ground temperature;electrical prospecting;selfpotential field;hydrothermal circulation

Full Text:

PDF

References

DOI: <https://doi.org/10.4401/ag-3088>

Published by INGV, Istituto Nazionale di Geofisica e Vulcanologia - ISSN: 2037-416X

USER

Username
Password
 Remember me

MOST VIEWED

- OPERATIONAL EARTHQUAKE FORECASTING....
- ObsPy – What can it do for data...
- Twitter earthquake detection:...
- Magnitude and energy of earthquakes
- Comparison between low-cost and...

AUTHOR GUIDELINES





EARLY PAPERS

- ▶ Vol 61, 2018

FAST TRACKS

- ▶ Vol 56, Fast Track 1, 2013
- ▶ Vol 57, Fast Track 2, 2014
- ▶ Vol 58, Fast Track 3, 2015
- ▶ Vol 59, Fast Track 4, 2016
- ▶ Vol 59, Fast Track 5, 2016
- ▶ Vol 60, Fast Track 6, 2017
- ▶ Vol 60, Fast Track 7, 2017
- ▶ Vol 61, Fast Track 8, 2018

ARTICLE TOOLS

-  Indexing metadata
-  How to cite item
-  Email this article (Login required)
-  Email the author (Login required)

ABOUT THE AUTHORS

University, Sapporo,
Japan

Y. Nishida
Institute of Seismology
and Volcanology, Faculty
of Science, Hokkaido
University, Sapporo,
Japan

S. Takakura
Institute of Seismology
and Volcanology, Faculty
of Science, Hokkaido
University, Sapporo,
Japan

N. Matsushima
The Geological Survey of
Japan, The National
Institute of Advanced
Industrial Science and
Technology (AIST),
Tsukuba, Japan

T. Mogi
The Geological Survey of
Japan, The National
Institute of Advanced
Industrial Science and
Technology (AIST),
Tsukuba, Japan

JOURNAL CONTENT

Search

Search Scope
All ▾

Browse

- [By Issue](#)
- [By Author](#)
- [By Title](#)

Journal Help

KEYWORDS

Central Italy
Earthquake GPS
Historical seismology
Ionosphere Irpinia
earthquake Italy Mt.
Etna Seismic hazard
Seismic hazard
assessment
Seismology UN/IDNDR
earthquake
earthquakes
historical
earthquakes
ionosphere magnetic
anomalies
paleoseismology
seismic hazard
seismicity
seismology

NOTIFICATIONS

- [View](#)
- [Subscribe](#)

USAGE STATISTICS INFORMATION

We log anonymous
usage statistics. Please
read the [privacy](#)
information for details.