Tawat Rung-Arunwan

Contact

Mailing Address: 44/128 My Condo Sukhumvit 81, Sukhumvit Rd.,
Bang Jak, Pha Kanong, Bangkok, Thailand 10260

E-mail: t.rungarunwan@gmail.com

Phone: +66 80 365 2365

Education

Ph.D. (Physics), Mahidol University, Bangkok, Thailand

Thesis: *Estimating Regional Mean Conductivity Profiles and Detecting Galvanic Distortion Using Magnetotelluric Rotational Invariants*
Advisor: Assoc. Prof. Weerachai Siripunvaraporn and Prof. Hisashi Utada

M.Sc. (Physics), June 2010, Mahidol University, Bangkok, Thailand

Thesis: *An Efficient Modified Hierarchical Domain Decomposition for Two-Dimensional Magnetotelluric Forward Problems*
Advisor: Assoc. Prof. Weerachai Siripunvaraporn

B.Sc. (Physics), First class honor, May 2006, Mahidol University, Bangkok, Thailand

Work Experience

2014–Present Senior Geophysicist at Curl-E Geophysics Co., Ltd.

Oct 2018–Mar 2019 Project Researcher at Earthquake Research Institute, the University of Tokyo.

Mar–May 2015 Contractor at KMS Technologies, Houston, Texas, USA, for LOTEM data acquisition.

Research Experience and Interest

- **Magnetotellurics (MT)**:
  - Data processing and performing 3D inversion of MT data
  - Galvanic distortion analysis.
  - Geothermal exploration using MT
  - Regional-scale studies by using long-period magnetotellurics
- **Computational geophysics**:
  - Developing domain decomposition technique for 2-D MT forward problems
  - Modifying the 3D inversion software (WSINV3DMT; Siripunvaraporn *et al.*, 2005) for MT data
- **Geophysics fieldworks**: MT, Direct Current Resistivity, Seismic surveys

Award

2012 **Outstanding Thesis Award** for Master degree thesis, Faculty of Graduate Studies, Mahidol University.

Scholarship

2009–2012 **Research assistantship**, Thailand Center of Excellence in Physics

2008–2009 **Teaching assistantship**, Mahidol University

Internship

Apr–Jul 2014 **Visiting research student**, Earthquake Research Institute, University of Tokyo, Japan

Mar–Jun 2013 **Visiting research student**, Earthquake Research Institute, University of Tokyo, Japan
Responsibility:
– Continuing long-period MT data analysis
– Distortion analysis on magnetotelluric impedance tensor
– Develop FORTRAN and MATLAB software for WSINV3DMT (Siripunvaraporn *et al.*, 2005)

Jul–Oct 2011 **Visiting research student**, Earthquake Research Institute, University of Tokyo, Japan
Responsibility:
– Continuing long-period MT data analysis
– Processing geomagnetic data
– 3-D MT forward modeling of Indo-Chinese peninsula by using WS3DINVMT (Siripunvaraporn *et al.*, 2005) and FS3D (Baba & Seama, 2002)
– MT survey at Mt. Fuji, Japan

Jul–Oct 2010 **Visiting research student**, Earthquake Research Institute, University of Tokyo, Japan
Responsibility:
– Processing long-period MT data collected from western Thailand by using BIRRP (Chave & Thompson, 2003) and EMTF (Egbert & Livelybrooks, 1996)
– 1-D Inversion of MT data by using Occam's inversion (Constable *et al.*, 1987)
– Training for absolute measurement for magnetic declination and inclination

Publications

T. Rung-Arunwan, W. Siripunvaraporn, and H. Utada. Magnetotelluric phase tensor inversion: A possible solution to avoid the effects of geologic noise. In Preparation, 2020.

H. Utada, **T. Rung-Arunwan**, and W. Siripunvaraporn. The magnetotelluric sampling theorem. In Preparation, 2020.

P. Amatyakul, S. Wood, **T. Rung-Arunwan**, C. Vachiratienchai, N. Prommakorn, P. Chanapiwat, and W. Siripunvaraporn. An assessment of a shallow geothermal reservoir of Mae Chan hot spring, northern Thailand by a series of magnetotelluric investigation. In Preparation, 2020.

S. Boonchaisuk, S. Noisagool, P. Amatyakul, **T. Rung-Arunwan**, C. Vachiratienchai, and W. Siripunvaraporn. 3-D magnetotelluric imaging of the Phayao Fault Zone, Northern Thailand: Evidence for saline fluid in the source region of the 2014 Chiang Rai earthquake. *Journal of Asian Earth Sciences*, 147:210 – 221, 2017.

T. Rung-Arunwan, W. Siripunvaraporn, and H. Utada. Use of ssq rotational invariant of magnetotelluric impedances for estimating informative properties for galvanic distortion. *Earth, Planets and Space*, 69(1):80, 2017.

K. Aizawa, H. Sumino, M. Uyeshima, Y. Yamaya, H. Hase, H. Takahashi, M. Takahashi, K. Kazahaya, M. Ohno, **T. Rung-Arunwan**, and Y. Ogawa. Gas pathways and remotely triggered earthquakes beneath Mount Fuji, Japan. *Geology*, 2016.

P. Amatyakul, S. Boonchaisuk, **T. Rung-Arunwan**, C. Vachiratienchai, SH. Wood, K. Pirarai, A. Fuangswasdi, and W. Siripunvaraporn. Exploring the shallow geothermal fluid reservoir of Fang geothermal system, Thailand by a 3-D magnetotelluric survey. *Geothermics*, 2016.

T. Rung-Arunwan, W. Siripunvaraporn, and H. Utada. On the Berdichevsky average. *Physics of the Earth and Planetary Interiors*, 253:1–4, 2016.

P. Amatyakul, **T. Rung-Arunwan**, and W. Siripunvaraporn. A pilot magnetotelluric survey for geothermal exploration in Mae Chan region, northern Thailand. *Geothermics*, 55(0):31–38, May 2015.

T. Rung-Arunwan and Weerachai Siripunvaraporn. An efficient modified hierarchical domain decomposition for two-dimensional magnetotelluric forward modelling. *Geophysical Journal International*, 183:634–644, November 2010.

Public presentation

Sep 2019 Presentation entitled "3-D multiphase flow modeling: a method to constrain electrical conductivity structure of volcanoes", Volcanological Society of Japan, Kobe University.

Oct 2019 Presentation entitled "3-D multiphase flow modeling: a method to constrain electrical conductivity structure of volcanoes", Society of Geomagnetism and Earth, Planetary and Space Sciences, Kumamoto, Japan.

Aug 2016 Poster presentation entitled "Detecting Galvanic Distortion", the 23rd EM Induction Workshop, Chiang Mai, Thailand

Nov 2015 Oral presentation entitled "Magnetotelluric surveys of the Mae Chan geothermal systems, Thailand", the 5th GEOINDO International Conference on Geology, Geotechnology, and Mineral Resources of Indo-China.

Aug 2014 Oral presentation entitled "A method to recover the background structure through the rotational invariants", the 22nd EM Induction Workshop, Weimar, Germany.

Oct 2008 Poster presentation entitled "Domain decomposition for 2D magnetotelluric forward modeling", the 19th EM Induction Workshop, Beijing, China.

Geophysical Fieldwork Experience

Jan 2010–Present	**Maintaining the geomagnetic observatory** at Kanchanaburi campus of Mahidol University, Kanchanaburi province*
Aug–Sep 2018	**Magnetotelluric field survey** for regional-scale study in the southern Thailand
Mar–Apr 2018	**Magnetotelluric field survey** for potential geothermal resources in the northern Thailand.
Oct 2014–Feb 2015	**Magnetotelluric field survey** for potential geothermal resources in the northern and southern Thailand for Promoting Geothermal Energy Generation and Local Industries in Thailand
Jan 5–9, 2014	Performing **geomagnetic absolute measurement**♯ and **polaris observation** at Kanchanaburi Geomegnetic Observatory, Thailand.
Mar 14–15, 2013	Trained in **polaris observation** at Kakioka Magnetic Observatory, Japan Meteorological Agency.
Jul–Aug 2013	**Magnetotelluric survey and data analysis** as a feasiblity study for geothermal resource in Mae Chan, Chiang-Rai province, the northern part of Thailand.
2010–2012	**Principal investigator** in **long-period magnetotelluric sounding** for studying the deep conductivity structure beneath western Thailand. As of now, a cluster of six telluric stations, three-to-four months long for each, are installed.
Jan 2012	Performing **geomagnetic absolute measurement**♯ **polaris observation** at Kanchanaburi Geomegnetic Observatory, Thailand.
Nov 2011	**2-D resistivity survey** and **vertical electrical sounding** for mapping bedrock in the hot spring area of Kanchanaburi province*
Aug 22–26, 2011	**Magnetotelluric survey** for studying the change of resistivity structure of Mt. Fuji, Japan, after Tohoku Earthquake (Mar 12, 2011)
Dec 2010–Feb 2011	**Seismic reflection and refraction survey** for mapping active faults in Kanchanaburi province*
Jan 2–15, 2011	**Attending geophysics field camp**† at Chiang Mai, Thailand, as an instructor in gravity and magnetic survey and data processing
Dec 2009–Mar 2010	**Magnetotelluric survey** (using **Phoenix** instruments) for studying crustal structure beneath Kanchanaburi province*

Jan 2–15, 2010 **Attending geophysics field camp**[†] at Chiang Mai, Thailand, as a participant

Nov 2008 **2-D resistivity survey** for mapping cavities in karst area, Kanchanaburi province[*]

[*]Kanchanaburi province, western Thailand, is the interesing area of geophysics research group, Mahidol University.
[†]This field camp is supported by Geoscientists *Without* Borders®, Society of Exploration Geophysicists Foundation, and co-hosted by Chiang Mai University, Thailand, Boise State University and Colorado School of Mines, USA.
[♯] Geomagnetic absolute measurement aims to obtain the actual magnetic declination and inclination.

Programming Skills

FORTRAN, Matlab, Unix Shell Scripting, C, C++

Geophysical Softwares: Generic Mapping Tools (GMT), Seismic Unix (SU), Phoenix MT data processing software (SSMT2000)

Typesetting Language: LaTeX

Extracurricular activity

Hosted the 23th Electromagnetic Induction Workshop, Chiang Mai, Thailand.
August, 2016, on behalf of Mahidol University.

Hosted the 6th International Conference on Applied Geophysics, Kanchanaburi, Thailand.
November, 2012, on behalf of Mahidol University.

References

Weerachai Siripunvaraporn, Mahidol University, Thailand (wsiripun@gmail.com)

Hisashi Utada[*], The University of Tokyo, Japan

Kurt Strack[*], KMS Technologies, USA

[*]Contacts are available upon request.

(As of October 29, 2019)