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Takeshi Tsuji

Professor, Department of Systems Innovation, School of Engineering, The University of Tokyo
7-3-1 Hongo, Bunkyo-ku, Tokyo 113-8656, Japan
Tel & Fax: +81-3-5841-8684
E-mail: tsuji@sys.t.u-tokyo.ac.jp

Research field

Takeshi Tsuji uses several geophysical and geodetic approaches (e.g., seismic, electromagnetic, gravity, and SAR) to image the subsurface structure and to monitor its dynamic behaviors. He is further interested in the modeling of dynamic behaviors of the earth.

Degrees

1998 – 2002: B.S., Resources and Environmental Engineering, Waseda University, Japan
2002 – 2004: MSc, Ocean Research Institute, the University of Tokyo, Japan
2004 – 2007: Ph.D., Ocean Research Institute, the University of Tokyo, Japan

History of employment

2007 (Apr) – 2007 (Aug): Post-doctoral researcher, JAMSTEC, Japan
2007 (Sep) – 2012 (Mar): **Assistant Professor**, Graduate School of Engineering, Kyoto University, Japan
2009 (Feb) – 2010 (Jan): Visiting scholar, Geophysics, Stanford University, USA
2012 (Apr) – 2017(Mar): Associate Professor, International Institute for Carbon-Neutral Energy Research (I2CNER), Kyushu University, Japan
2013 (June) – 2022 (Mar): Division Head (Lead PI), Multiscale Science and Engineering for Energy and the Environment thrust, I^2CNER, Kyushu University, Japan
2017 (Apr) – 2022 (Mar): **Professor,** International Institute for Carbon-Neutral Energy Research (I^2CNER), Kyushu University, Japan
2017 (Apr) – 2022 (Mar): **Professor,** Department of Earth Resources Engineering, Kyushu University, Japan
2020 (Apr) –2021 (Mar): **Department Head**, Department of Earth Resources Engineering, Kyushu University, Japan
2019 (Apr) –2021 (Mar): **Adjunct Professor,** Kyoto University, Japan
2022 (Apr) – present: **Professor,** Department of Systems Innovation, Faculty of Engineering, The University of Tokyo, Japan

Other employment

2004-2007: IODP-USIO logging staff scientist, JOI Alliance/Lamont-Doherty Earth Observatory
2008-2014: Visiting Scientist, JAMSTEC (2013-2014: Senior Visiting Scientist)
2008-2012: Visiting Lecturer, Kansai University
2010: Co-Chief Scientist, Integrated Ocean Drilling Program (IODP) Exp. 327

Selected Honors

2005: Incentive Award, Society of Exploration Geophysics Japan
2010: Japan Society for the Promotion of Science (JSPS) Excellent Young Researchers Overseas Visit Program *"Honored fund for long-term visit in Stanford University"*
2013: Incentive Award, Society of Exploration Geophysicists of Japan (SEGJ), June 7, 2013.
2015: Early Career Researcher Award, Seismological Society of Japan (SSJ), March 9, 2015.
2015: Yoshiaki Ozawa Award, The Geological Society of Japan (GSJ), June 29 2015.

2016: The Young Scientists' Prize, The Commendation for Science and Technology by the Minister of Education, Culture, Sports, Science and Technology (MEXT), April 12 2016.
2016: Highly Cited Research Award from Tectonophysics, Elsevier
2017: Island Arc award, Geological Society of Japan
2019: International Union of Geodesy and Geophysics (IUGG), Early career scientist award
2020: Western Japan Cultural Award, Nov 3, 2020.

Publications and presentations

166 peer-reviewed journals & >120 Invited presentations

(Selected publications)

T. Tsuji, T. Ikeda, R. Matsuura, K. Mukumoto, H.F. Lawrens, T. Kimura, K. Yamaoka, M. Shinohara (2021), Continuous monitoring system for safe managements of CO2 storage and geothermal reservoirs, ***Scientific Reports***, 11, Article number 19120.

T. Tsuji, M. Sorai, M. Shiga, S. Fujikawa, T. Kunitake (2021), Geological storage of CO2-N2-O2 mixtures produced by membrane-based direct air capture (DAC), ***Greenhouse Gases: Science and Technology***, 11(4), 610-618. doi: 10.1002/ghg.2099, 2021

A.B. Ahmad, and **T. Tsuji** (2021), Machine learning for automatic slump identification from 3D seismic data at convergent plate margins, ***Marine and Petroleum Geology***, 133, 105290.

F. Jiang, J. Yang, E. Boek, **T. Tsuji** (2021), Investigation of viscous coupling effects in three-phase flow by lattice Boltzmann direct simulation and machine learning technique, Advances in Water Resources, Vol. 147, 103797, doi:10.1016/j.advwatres.2020.103797.

Y. Suemoto, T. Ikeda, and **T. Tsuji**, (2020), Temporal variation and frequency dependence of seismic ambient noise on Mars from polarization analysis, ***Geophysical Research Letters,*** Vol. 47, Issue 13, Page e2020GL087123, doi:10.1029/2020GL087123.

T. Tsuji, T. Ikeda, F. Jiang (2019), Evolution of hydraulic and elastic properties of reservoir rocks due to mineral precipitation in CO2 geological storage, ***Computers and Geosciences,*** 126, 84-95.

H. Nimiya, T. Ikeda, and **T. Tsuji** (2017), Spatial and temporal seismic velocity changes on Kyushu Island during the 2016 Kumamoto earthquake, ***Science Advances,*** Vol. 3, no. 11, e1700813, doi:10.1126/sciadv.1700813.

T. Tsuji, S. Minato, R. Kamei, T. Tsuru, and G. Kimura (2017), 3D geometry of a plate boundary fault related to the 2016 Off-Mie earthquake in the Nankai subduction zone, Japan, ***Earth and Planetary Science Letters***, Vol.478, 234-244, doi:10.1016/j.epsl.2017.08.041.

Y. Liang, S. Tsuji, J. Jia, **T. Tsuji**, and T. Matsuoka (2017), Modeling CO2-Water-Mineral Wettability and Mineralization for Carbon Geosequestration, ***Acc. Chem. Res.***, 50 (7), 1530-1540.

T. Tsuji, J. Ishibashi, K. Ishitsuka, and R. Kamata (2017), Horizontal sliding of kilometre-scale hot spring area during the 2016 Kumamoto earthquake, ***Scientific Reports***, 7, 42947.

T. Tsuji, F. Jiang, K. Christensen (2016), Characterization of immiscible fluid displacement processes with various capillary numbers and viscosity ratios in 3D natural sandstone, ***Advances in Water Resources***, 95, 3-15.

Selected current research projects

1. Develop continuous monitoring system for CCS, geothermal power and oil/gas exploitation.
2. Imaging, monitoring, and modeling of the seismogenic faults and volcanoes.
3. Multiphase flow modeling from nanoscale to field-scale; reveal dynamic subsurface behaviors (e.g., multiphase fluid behavior, dissolution, and mineralization).
4. Application of machine learning to the earth science, social activity and plant optimization
5. Geophysical explorations in extraterrestrial environments (Moon, Mars and Titan)

Professional Society

Society of Exploration Geophysics of Japan (SEGJ), The Geological Society of Japan (GSJ), Seismological Society of Japan (SSJ), The Society of Materials Science, Japan (JSMS), Japan Geoscience Union (JPGU), The Mining and Materials Processing Institute of Japan (MMIJ), Society of Exploration Geophysists (SEG), American Geophysical Union (AGU), Global CCS Institute, European Geophysical Union (EGU), InterPore etc.