

一般研究集会（課題番号：29K-07）

集会名：スロー地震国際研究集会 2017

主催者名：文部科学省・日本学術振興会 科学研究費助成事業 新学術領域研究「スロー地震学」

研究代表者：杉岡 裕子

所属機関名：神戸大学大学院理学研究科

所内担当者名：伊藤 喜宏・山下 裕亮

開催日：平成29年9月19-21日

開催場所：愛媛県松山市 ホテルマイステイズ松山

参加者数：130名（所外 124名，所内 6名）

・大学院生の参加状況：30名（修士20名，博士10名）

・大学院生の参加形態 [口頭ないしポスター発表]

研究及び教育への波及効果について

西南日本で発見された非火山性微動の発見（Obara, 2002）を皮切りに日本が中心となって推進してきたスロー地震学に関わる研究成果を報告する本研究集会は、2014年から継続して実施しているが、今年は昨年よりもより多くの内外の研究者の参加があり、確実な波及効果が伺える。また、学部生や大学院生、ポストドク研究員などの若手研究者の参加人数も年々増加の傾向にあり、コミュニティの裾野も確実に拡大している。

研究集会報告

(1)目的

南海トラフ巨大地震とスロー地震の関連性についての理解を深めるため、地質調査・地球物理観測・物性実験・数値モデリングなど、様々なアプローチによるスロー地震研究の内外の最新の結果および情報を持ち寄り、目的に向けた各々の結果の有機的な共有、結合が図れるような議論の場となることを目的とした。

(2)成果のまとめ

本研究集会では、2016年度からスタートした科研費新学術領域研究「スロー地震学」（代表：小原一成）の参画者も中心に企画され、国内外から非常に幅広い分野にわたる研究者が一同に会し、地球物理学的、物質科学的、地質学的アプローチによる研究成果が報告された（43件の講演および62件のポスター発表）。21世紀初頭に発表されたスロー地震の発見論文（Obara, 2002）を契機として発展してきたスロー地震学は2011年の東北沖地震以降はひとつの局面を迎えており、本研究集会のテーマでもある巨大地震とスロー地震の関連性を示唆する研究成果も報告された。また、今後予定されている観測計画の詳細や最新の研究結果を踏まえた既得データの利用方法など極めて実用性の高い議論も交わされた。本研究集会の日程及び開催地は、前日まで同市内で開催された日本地質学会年学術大会と連続させることで地質学関連研究者へスロー地震分野の周知を狙ったもので、コミュニティの拡大に貢献したと言える。

(3)プログラム

Day 1 (Sep. 19)

Session 1 (Chair: Hitoshi Hirose)

9:15 Satoshi Ide, Opening Remarks

9:20 Eiichiro Araki, Recurring shallow slow slip events observed in the Nankai Trough: need for low noise high sensitive observation network

9:35 Jun'ichi Fukuda, Variability of the space-time evolution of slow slip events off the Boso Peninsula, central Japan, from 1996 to 2014

9:50 Jing Wu, Aftershock Detection of 2013 Mw6.6 Lushan in Longmenshan Fault Zone, Eastern Tibet

10:05 Naoki Uchida, Interaction between slow earthquakes and repeating earthquakes in Nankai subduction zone

Session 2 (Chair: Hitoshi Hirose)

10:40 Takashi Okuda, Variation in rupture process of moderate size repeating earthquakes occurred in the Off-Naka, Ibaraki prefecture, region

10:55 Tomoaki Nishikawa, Recurring slow slip events and earthquake nucleation in the source regions of the M7 Ibaraki-Oki earthquakes inferred from seismicity

11:10 Ryo Okuwaki, Rupture evolution during the 2015 Illapel Chile earthquake in relation to collocated earthquake swarms

11:25 Sergio Ruiz, Nucleation phase and dynamic inversion of the Mw 6.9 Valparaiso 2017 earthquake in Central Chile

13:10 Announcements for the slow earthquakes project members (conducted in Japanese)

Session 3 (Chair: Takahiro Hatano)

13:40 Kyuichi Kanagawa, Frictional properties of accretionary mud/mudstone samples and their implications for a transition of aseismic to seismic faulting within the hanging wall of the Nankai Trough subduction zone

13:55 Akito Tsutsumi, Transition of frictional velocity dependence of subduction zone fault material as a function of effective normal stress

14:10 Tetsuo Yamaguchi, Slow to fast slip transition in friction of gels

14:25 Julien Scheibert (invited), Evolution of real contact area under shear and the value of static friction

Session 4 (Chair: Takahiro Hatano)

15:15 Eiichi Fukuyama, Direct monitoring of 2-D rupture nucleation process during large-scale biaxial rock friction experiments

15:30 Deepa Mele Veedu, Dynamics of fault slip near the stability transition combining laboratory and numerical experiments

15:45 Harsha S. Bhat (invited), Fast and slow earthquakes emerge due to fault geometrical complexity

16:15 Takehito Suzuki, Phase transition and universality in the system including common nullclines associated with dynamic earthquake slip

16:30 Ryosuke Ando Temperature and modes of slow earthquakes

17:00-19:00 Poster session (A1, B1)

19:00-21:00 Social Party

Day 2 (Sep. 20)

Session 1 (Chair: Hiroko Sugioka)

9:05 Abhijit Ghosh (invited), Abundant very low frequency earthquakes (VLFs) in Cascadia operate independent of tremor activity

9:35 Kazushige Obara, Various slow earthquake activities due to along-strike transition of interplate coupling in the western Nankai trough region

9:50 Akira Hikita, Fine-scale variations of deep low frequency tremor activity detected in western Shikoku, southwest Japan

10:05 Ting Wang, Identifying the recurrence patterns of non-volcanic tremors in the Shikoku region using a 2D hidden Markov model

Session 2 (Chair: Kazushige Obara)

10:40 Sadaomi Suzuki, Low frequency earthquake distribution covered with undrained layer along the Tokai plate boundary in the Nankai subduction zone

10:55 Lisa Kaneko, Slow earthquakes in microseism frequency band (0.1-2 Hz) off the Kii peninsula

11:10 Miho Asada, An initial idea of overlapping distribution of submarine mud volcanoes and slow slip events

Session 3 (Chair: Yusuke Yamashita)

13:00 Evgeny Podolskiy, Glacial tremor and Long-Period events: members of slow earthquake family?

13:15 Akiko Takeo, The characteristic sizes of very low frequency earthquakes in southwest Japan

- 13:30 Satoshi Ide, Characteristics of broadband slow earthquakes explained by a Brownian model
- 13:45 Takanori Matsuzawa, Numerical study of the effect of various earth tides on slow slip events
- 14:00 Bunichiro Shibazaki, Modeling slow-slip events and their triggering by the Kaikoura earthquake along the Hikurangi subduction plate interface

Session 4 (Chair: Satoshi Ide)

- 14:35 Aitaro Kato, Down-dip variations in a subducting low-velocity zone linked to episodic tremor and slip: a new constraint from ScSp waves
- 14:50 Katsuhiko Shiomi, Seismological features around the LFE zone beneath western Shikoku based on converted Ps phases
- 15:05 Junichi Nakajima, Seismic evidence for episodic drainage from the megathrust by slow slip
- 16:00-18:00 Poster session (A2)

17:00-18:00 Administrative Group Meeting

18:00-19:00 Project Group Meeting

Day 3 (Sep. 21)

Session 1 (Chair: Kimihiro Mochizuki)

- 9:00 Mamoru Nakamura, Seasonal variation in tidal response of very low frequency earthquakes in the Ryukyu Trench
- 9:15 Ayumi Kinjo, Low Frequency Earthquakes Along the Ryukyu Islands Triggered by Teleseismic Earthquakes
- 9:30 Makoto Uyeshima, The first report on the subsurface electrical resistivity structure obtained from the Network-MT survey in the vicinity of area with a forthcoming slow slip event in the SW part of the Shikoku Island, SW Japan
- 9:45 Wiebke Heise (invited), Imaging the transition from weakly to strongly coupled plate interface at the Hikurangi margin, New Zealand

Session 2 (Chair: Kohtaro Ujiie)

- 10:35 Kimihiro Mochizuki, Offshore earthquake and tremor activity around the slow slip region of northern Hikurangi subduction zone
- 10:50 Yuriko Iwasaki, Continuous shear wave signal with stable polarization direction following 2014 Mw 6.8 slow-slip event in the Hikurangi subduction margin offshore New Zealand
- 11:05 Donna Eberhart-Phillips (invited), Relationship of the 3-D distribution of fluid and SSE behavior along the shallow Hikurangi subduction zone, using P- and S wave attenuation

Session 3 (Chair: Naofumi Aso)

- 13:10 Virginia Toy, Insights from microstructures of the plate boundary thrust sampled during JFAST into the development of fault rock fabrics capable of localizing subduction zone plate boundary shear
- 13:25 Gaku Kimura, Upper Plate hysteresis controlling seismogenic rupture area, slow slip area in Subduction Zone; example from the Nankai Trough
- 13:40 Kohtaro Ujiie, Low-angle brittle shear slip, tensile overpressure, and ductile shear recorded in subducted mélanges: Implications for episodic tremor and slip in subduction zones
- 13:55 Ake Fagereng (invited), Dehydration, embrittlement, and tectonic tremor below the locked zone
- 14:30 Kazushige Obara, Closing Remarks

(4)研究成果の公表

下記ホームページにて公開

<http://www.eri.u-tokyo.ac.jp/project/sloweq/events-activities/2017.html>