

Workshop 04-06 July 2016

「活断層破砕帯の特性と年代測定」

Properties of active fault damage zones and fault dating

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Venue: Science seminar house, Yoshida North Campus, Kyoto University

INTRODUCTION

最近活動があった断層帯の調査は地震被害の緩和政策に貢献することができる。特に最近の断層活動の時期、繰り返しの周期と地震発生の確率などを含めた、潜在的な地震の震源地とその原因となり得る断層の活動を特定することは有益である。

このワークショップの目的は、断層破砕帯の特性・過程と、野外調査・トレンチング・ボーリングから得た断層帯物質の年代測定についてよりよく理解するために、異なる分野から知識を集めることである。

ワークショップでは、現地調査、トレンチと採掘の調査、断層岩石の年代測定、ラボ実験などに基づいて、地質学、地球物理学、地球年代学、熱年代測定研究など様々な分野の立場から議論する予定である。

Assessment of recent activity of fault zones has a direct societal application in the mitigation of earthquake hazards, especially the identification of potential seismogenic sources and the activity of the source faults including the timing of recent faulting event, recurrence interval and probability of earthquake occurrence.

The scope and goal of this workshop is to bring together different disciplines enhancing our knowledge on the properties and processes of fault damage zones and dating of fault rock materials from field, trench and drilling of fault zones.

Multi-disciplinary contributions from geological, geophysical, geochronological and thermo-chronological studies based on the field observations, trenching and drilling investigations, dating fault rock samples, and lab-experiments will be discussed during the workshop.

WORKSHOP OUTLINE

Day 1: 4 July 2016: Nojima fault zone: Previous studies and geochemistry.

Day 2: 5 July 2016: Rock physics and structural geology.

Day 3: 6 July 2016: Field trip Nojima fault zone drilling and Nojima Fault Preservation Museum, Awaji Island. [Restricted access, due to bus capacity]

WORKSHOP PROGRAM

| Day 1 | 04/07/2016 | Previous studies and geochemistry | page # |
|-------------|---|---|--------|
| 8:30-8:45 | Welcome | | |
| 8:45-9:15 | Horst Zwingmann Kyoto University | Workshop introduction and house keeping | |
| 9:15-10:00 | Aiming Lin Kyoto University | Property of active fault damage zone and assessment of fault activity | 18 |
| 10:00-10:15 | BREAK | Opportunity to view student posters | |
| 10:15-11:00 | Kinya Nishigami DPRI Kyoto University | Overview of geophysical studies in the Nojima Fault Zone Probe Project-Repeated water injection experiments and borehole measurements | 19 |
| 11:00-11:45 | Norio Shigematsu GSJ AIST | Evaluation of faults in a site of power plants and stress analyses | 21 |
| 11:45-12:30 | Kentaro Omura NIED | Drilling investigations on the structure and mechanics of active fault - a case history of Nojima fault at Kobe earthquake 1995 - | 22 |
| 12:30-13:30 | LUNCH BREAK | Workshop group photo | |
| 13:30-14:15 | Andreas Mulch University Frankfurt | Meteoric fluids in fault and detachment systems | 24 |
| 14:15-15:00 | Takahiro Tagami Kyoto University | Overview of low-temperature thermochronology with implications for thermal processes and dating of fault zones | 25 |
| 15:00-15:45 | Noriko Hasebe Kanazawa University | Potential of thermoluminescence method to estimate the time-temperature condition of fault activity | 26 |
| 15:45-16:00 | BREAK | Opportunity to view student posters | |
| 16:00-16:30 | Seiko Yamasaki GSJ AIST | K-Ar dating of fault gouges - Case studies for granite-origin gouges within Japanese faults | 28 |
| 16:30-17:15 | Pereach Nuriel Geological Survey of Israel | Calcite U-Pb ages constrain dead sea fault activity | 30 |
| 17:15-18:00 | DISCUSSION | | |

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| DAY 2 | 5/07/16 | Rock physics and structural geology | page # |
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| 8:15-8:30 | Welcome | | |
| 8:30-9:15 | Akito Tsutsumi Kyoto University | Frictional properties of rocks at seismic slip rate: a brief review | 31 |
| 9:15-10:00 | Masa Niwa JAEA GIFU | Study on faulted materials for an assessment of fault activity in JAEA: Structural and geochronological approaches | 32 |
| 10:00-10:30 | BREAK | Opportunity to view student posters | |
| 10:30-11:15 | Giulio Viola NGU | Deconvoluting complex structural histories archived in brittle fault zones | 34 |
| 11:15-12:00 | Jussi Mattila POSIVA | Geological characterization and monitoring of faults at the site of an underground repository of high-level nuclear waste, Olkiluoto, Finland | 36 |
| 12:00-12:45 | Espen Torgersen NGU | Microstructural Analysis — A Key to the Successful Dating of Faults | 38 |
| 12:30-13:30 | LUNCH BREAK | | |
| 13:30-14:15 | Takako Satsukawa Kyoto University | Formation of pseudotachylyte in the lower crust plastic regimes | 39 |
| 14:15-14:45 | Koki Kashiwaya Kyoto University | Spatial variation of permeability around faults in Toki granite | 41 |
| 14:45-15:15 | Dawn Kellett Geological Survey Canada | Influence of shear zone deformation and fluids on Ar retention in white mica | 42 |
| 15:15-15:45 | BREAK | Opportunity to view student posters | |
| 15:45-16:15 | Catherine Mottram Dalhousie University | Dating paleoseismicity in the Himalayan orogen | 44 |
| 16:15-16:45 | Horst Zwingmann Kyoto University | Brittle Fault zone investigations and dating - what do we know and what not | 45 |
| 16:45-17:30 | DISCUSSION | | |
| 17:30-18:00 | WRAP UP | | |

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| DAY 3 | 6/07/16 | Field trip Nojima drilling site | |
| ~ 8:30-17:00 | Masaki Murakami OYO | Introduction to boreholes in the 2016 Nojima active fault zone drilling project Visit Nojima Fault Preservation Museum, Awaji Island | 46 |