Ref.No.45

September 06, 2016

Director Kazushige Obara
Earthquake Research Institute
The University of Tokyo

To whom it may concern,

Earthquake Research Institute Joint Usage/Research Program

Call for proposals for research projects and workshops for the Academic Year 2017

The Earthquake Research Institute has been designated as a nationwide Joint Usage/Research Center for Earthquake and Volcano Sciences by the Ministry of Education, Culture, Sports, Science and Technology since the academic year 2010.

The goal of this center is to promote solid-earth sciences related to earthquakes and volcanoes, science and engineering to mitigate disasters caused by earthquakes and volcanic eruptions, and observational research both in Japan and abroad for the prediction of earthquakes and volcanic eruptions. In order to achieve this goal, the ERI conducts joint researches, accepts visiting researchers from both Japan and abroad, and provides facilities, equipment, materials, and data held by the ERI to related research institutions nationwide.

This time, we call for proposals for joint research projects, those for workshops and participants for Specific Research Projects for the Academic Year 2017.

1. Categories (See the Application Guidelines for the details):
   (1) Joint Research
   (2) Workshops/Symposia
   (3) Usage of Facilities, Laboratory Equipment, and Observation Equipment.
   (4) Usage of Data and Records.
   * We call for proposals for (1) and (2) annually. Please be aware that the period of application submission varies depending on the specific categories. Applications for (3) and (4) are accepted all year round but with some exceptions.

2. Eligibility for application:
   Faculty members and researchers of national, public, and private universities, or national and public research institutions, and their equivalents (a professor emeritus, graduate students, and researchers in private companies) are eligible to apply. For more explanations about students, please refer the “13. precautions (5).”

3. Submission of proposals:
   Fill out necessary fields on the specified forms to be found on the joint usage homepage

(http://www.eri.u-tokyo.ac.jp/en/joint-usage-top/) and submit the form online.

Please follow the procedure shown in the homepage on Web-application guideline.

(http://www.eri.u-tokyo.ac.jp/en/web-application/)

- Please have the principal investigator apply for general research projects and workshops.
- Applications to participate in specific research projects do not have to submit the application form in the case that the role of the applicants in the projects is decided with the principal investigator: submitting personal information and assigned project number via the web site completes the application.

4. Period of research: From April 2017 to March 2018.

5. Review Policy:

The Joint Usage Committee of the ERI will review the submitted applications. It is important that the content of the research plan follows the intent of the category for the joint usage/research program. It is required for a proposed project/workshop has relevance to the researches conducted in the ERI and/or to the facilities, equipment, records and data provided by the ERI. Applications are reviewed by all members of the Joint Usage Committee from several special fields. Please make the application with awareness of this point.

For specific research projects (A), (B), and (C), the ERI will compile all submitted participation applications for each project and send them to the principal investigator of the project. The principal investigator should submit a proposal for a review by summarizing the application information before mid-November.

6. Application Deadline: October 31, 2016 (Mon).

7. Submission of Letter of Consent:

All members of a "1. Joint Research," except those who belong to the ERI, must submit a Letter of Consent (Form C-2). Please submit one signed by the head of your affiliated institution before November 14, 2016 by postal mail to the mailing address shown at the end. In case that an applicant transferred to a new institution, submit a Letter of Consent signed by the head of the new place without delay.

Letter of Consent is not required for the one applying for "2. Workshops/Symposia," "3. Usage of facilities, laboratory equipment, and observation equipment" or "4. Usage of data and records."

8. Submission of Confirmation of Research Ethics form:

In response to the "Guidelines for Responding to Misconduct in Research" established by the Minster of Education, Culture, Sports, Science and Technology on August 26, 2014, a Confirmation of Research Ethics form (Form C-2, page 2) must be submitted by the participants for "1. Joint Research," "3. Usage of facilities, laboratory equipment, and observation equipment", and "4. Usage of data and records." Submission of the form is not required for the participants for "2. Workshops/Symposia." Members of the University of Tokyo do not have to submit the form, either. Please send a signed Confirmation of Research Ethics form

by postal mail to the mailing address shown at the end.

9. Review Results:

The Joint Usage Committee of the ERI will determine results of reviews for all applications, and principal investigators of the projects will be informed the results before late March, 2017.

10. Funds for research/workshop:

The ERI will make expenditures for research/workshop expenses (travel costs, consumables and service fees) within its budget. Expense for an equipment is not allowed basically. Please check the definition and examples of the equipment and the consumable in "13. precautions (6)."

11. Acknowledgements:

On publishing papers based on the results of the researches performed under the ERI's joint usage/research program, please acknowledge the program in the paper. Also, please provide a copy of the paper to the ERI.

12. Lodging facilities:

The ERI is not equipped with lodging facilities. Please arrange accommodations by yourself.

13. Precautions:

(1) When using facilities, comply with the rules of the ERI as well relevant laws, and follow the directions of the director for better management and safety.

(2) Keep in adequate contact with and follow the orders of the contact person and/or related members in the ERI when executing budget, implementing research, and using equipment.

(3) Losses and damages suffered by participants of the joint research projects or users of the equipment from outside the University of Tokyo shall be covered by their institution, and the University of Tokyo is not liable for them. A student participating in a joint research project should take out an accident insurance. If provided equipment or accessories are damaged or lost, repairs or replacement will be made in the sole responsibility of the user. If defects are found after a device is returned, repair fees maybe claimed from the one responsible.

(4) If you create intellectual property through this joint usage program, please inform the contact person at the ERI and research group members before making a copyright or patent application. Additionally, please contact the intellectual property department of your affiliated institution. Division of rights and the application procedures will be determined following discussion among related parties.

(5) Graduate students may participate in the projects as members of a research group with acceptance of his / her supervisor, but as a rule they may not become a principal investigator. Graduate students may, however, apply as a principal investigator to use

facilities, equipment, and data. Undergraduate students cannot participate in the projects, but can be a “research assistant” by request of the principal investigator. A letter of consent is needed for the “research assistant”, too. Please contact the “Research Support Team” if you want to add a new “research assistant”.

(6) A material that is durable more than one year and also costs more than ¥100,000 per one piece/set is considered as the equipment. But, batteries/cells, chemicals, or software are handled as the consumable, even if they are expensive. Please contact to the Research Support Team (Joint Usage Section), if it is difficult to decide.

(7) Please make any other inquiries regarding the joint usage program to the Research Support Team (Joint Usage Section).

[Contact Information]
1-1-1 Yayoi, Bunkyo-ku, Tokyo 113-0032
Earthquake Research Institute, the University of Tokyo
Research Support Team (Joint Usage Section)
Phone: 03-5841-5710, 1769
FAX: 03-5689-4467
Email: k-kyodoriyo@eri.u-tokyo.ac.jp

Application Guidelines

In order to facilitate researches in the fields relevant to earthquakes and volcanoes across Japan, the Earthquake Research Institute conducts various joint usage/research programs. Applications for joint researches are accepted annually.

Please refer to the explanations in the following, and apply online web system from the site.

http://www.eri.u-tokyo.ac.jp/sharing/index.html

Forms required for applications and related information are posted to the above URL.

If you apply for usage of equipment, please arrange a plan for the usage with a person in charge for the equipment at the ERI before submitting an application.

1. Joint Research

(1) Specific Research Project (A):

Specific Research Project (A) is for research projects that already have funds other than that by the joint usage/research program. Individual projects are being conducted nationwide by the ERI and/or other institutions, such as joint research based on "Promoting the Earthquake and Volcano Hazards Observation and Research Program (proposition)" (hereinafter "Earthquake and Volcano Hazard Mitigation Research." We call for applications to participate in these projects.

Research projects in this category are listed in Appendix T-2A. Expenses to work for the projects will be supported. The maximum research expenses for each project should be ¥300,000 or less annually. Applicants to participate in projects under "Earthquake and Volcano Hazard Mitigation Research" (Research Title No. 2017-A-01, see Appendix T-2A-2 for projects) must not be a member of a research institution that receives project funds from "Earthquake and Volcano Hazard Mitigation Research." Details of each research project can be found at the following website.

http://www.eri.u-tokyo.ac.jp/YOTIKYO/H29/project.html

An applicant should contact the principal investigator of the project or the contact person of the project at the ERI that he/she wishes to join to arrange research plan and submits the participation application (Form T-3A) with the principal investigator.

Applicants who wish to participate in the project listed in Appendix T-2A but other than those for No. 2017-A-01 should submit application form T-3B.

A principal investigator of a project must submit a report (Form T-5AC) within in 30 days of the completion of the research period through the online web system.

As for the projects in No. 2017-A-01, acknowledgements for the joint usage/research program by the ERI must be included in publications and participants shall be obligated to submit reprints of the publications.

(2) Specific Research Project (B):

The projects in this category include those planned by individual researchers or research groups with the aim of forming future large-scale projects. Those who wish to participate in these projects are invited for application. The projects in this category are not currently supported by large-scale project-funds such as the "Earthquake and Volcano Hazard Mitigation Research." Exploratory or international/interdisciplinary

subjects are registered as in Appendix T-2B.

Period of research for a project is one year, but it may be continued as long as three years. Research expense for a project must be ¥2,000,000 or less per year. Expenses shall include expenses for travel, consumables and services to conduct the research project.

Those who are interested in joining the project should inquire about the details of the research project with the principal investigator of it or the contact person of the project at the ERI. Those who wish to join the research projects listed in Appendix T-2B should submit application form T-3B.

A principal investigator of a project must submit a project report (Form T-5B) within 30 days of the completion of the research period through the online web system.

(3) Specific Research Project (C):

The projects in this category include those operated with funding other than joint usage/research program but the ERI approved as projects that belong to the program. The projects are listed in Appendix T-2C.

Those who are interested in participating a project should inquire about the details of the research content with the principal investigator of it or the contact person of the project at the ERI. Those who wish to join the research projects listed in Appendix T-2C should submit application form T-3B. Some research titles are open to applications at all times of a year.

A principal investigator of a project must submit a project report (Form T-5AC) within 30 days of the completion of the research period through the online web system.

(4) General Research Project:

This category is for joint research projects conducted by small group of researchers formed from inside and outside of the ERI. Proposals that further advance researches performed at the ERI, and those would stimulate research activities in the ERI are welcome. In addition, proposals that involve foreign visiting researchers accepted by the ERI's International Research Promotion Office for the joint usage/research program are given appropriate consideration. Proposals for researches that are not yet conducted at the ERI are also welcome. A principal investigator of a project must be a faculty member or researcher of university/institution other than the ERI, and at least a member of the ERI must be involved in the project. A principal investigator of a project should submit an application (Form G-1).

A project in this category shall receive ¥500,000 or less for travel cost, consumables and services to conduct the research. However, appropriate considerations shall be made for research projects that require more than ¥500,000 by some reasons.

For researches conducted at the ERI, please see the "2015 Handbook for Earthquake Research Institute, University of Tokyo" or check the ERI website at (http://www.eri.u-tokyo.ac.jp/).

A principal investigator of a project must submit a project report (Form G-2) within 30 days of the completion of the research period through the online web system.

(5) Cooperative Study on Elucidation and Prediction of Earthquakes and Volcanic Eruptions:

This category is for research projects related to items in "Earthquake and Volcano Hazard Mitigation Research." The items are "1. Research for elucidation of earthquakes and volcanic phenomenon" or "2.

Research for prediction of earthquakes and volcanic eruptions," and proposals for new researches that are not listed in Appendix T-2A-2 are accepted. Period of research for a project is one year, but it may be continued as long as three years or until end of the project. Research funds shall be ¥1,000,000 or less per research project per year. Expenses shall include travel costs and joint research expenses (consumables and service fees). Please clarify which research item the proposed research is related [Ex: 1. (2) a Plate boundary massive earthquakes]. Proposals for research projects related to item "3. Research for incentive prediction of earthquake and volcanic eruption disasters" will be accepted by another program run jointly by the ERI and the Disaster Prevention Research Institute, Kyoto University.

Please refer to the following URL for details on "Earthquake and Volcano Hazard Mitigation Research."

http://www.mext.go.jp/b_menu/shingi/gijyutu/gijyutu6/toushin/attach/1341570.htm

The Coordinating Committee of Earthquake and Volcanic Eruption Prediction Researches conducts initial review of the proposals, and the Earthquake Research Institute Joint Usage Committee will make final decision regarding the review.

A faculty member from the Coordination Center for Prediction Research of Earthquakes and Volcanic Eruptions shall be the contact person at the ERI for accepted research projects. Principal investigator of a project should submit an application (Form Y-1).

A principal investigator of a project must submit a project report (Form Y-2) within 30 days of the completion of research period through the online web system. Another project report in the format set by the Coordinating Committee of Earthquake and Volcanic Eruption Prediction Researches must be submitted at the end of every academic year. Also, the results of the project should be presented at the annual-report-meeting held in March every year.

As for the projects in this category, acknowledgements for the joint usage/research program by the ERI must be included in publications and participants shall be obligated to submit reprints of the publications.

(6) Cooperative Study on High Energy Geophysics Research:

This category is for research projects related to items in "High Energy Geophysics Research." Proposals based on industry-academia collaboration are given high priorities, in particular with matching funds of the applicants themselves.

Period of research for a project is one year, but it may be continued as long as three years. Research funds shall be ¥1,000,000 or less per research project per year. Expenses shall include travel costs and joint research expenses (consumables and service fees).

The Coordinating Committee of High Energy Geophysics Research conducts initial review of the proposals, and the Earthquake Research Institute Joint Usage Committee will make final decision regarding the review.

A faculty member shall be the contact person at the ERI for accepted research projects. Principal investigator of a project should submit an application form H-1, together with form C-3 on agreement regarding intellectual properties produced in the research project.

A principal investigator of a project must submit a project report (Form H-2) within 30 days of the completion of research period through the online web system. As for the projects in this category, acknowledgements for the joint usage/research program by the ERI must be included in publications and participants shall be obligated to submit reprints of the publications.

2. Workshops/Symposia

This category is for holding workshops and symposia for topics on earthquakes, volcanoes and related sciences. The length of a workshop or symposium is supposed as one to three days. The category includes summer school and other workshops that are expected to contribute to the development of the research community on earthquakes, volcanos and related field. A representative of workshop/symposium should submit an application (Form W-1). At least one member of the ERI must be included in the application as a contact person. The venue shall be in the Earthquake Research Institute. If a workshop is to be held outside of the ERI (including overseas), please state the necessity for this clearly.

Domestic workshop/symposium will receive ¥1,000,000 or less, and international one will do ¥2,000,000 or less, per a workshop/symposium. The fund is spent to cover travel and printing costs.

If major changes in the plan, such as a change of venue, are needed, those should be reviewed again at the Joint Usage Committee of the ERI. The representative of the workshop/symposium should submit a statement of the reason explaining the changes as soon as possible to the Research Support Team of the ERI.

The Joint Usage Committee will evaluate the original proposal and the statement of the reason to decide whether to approve the changes or not.

The representative to the workshop/symposium must submit a workshop/symposium report (Form W-2) within 30 days of the completion of the workshop/symposium through the online web system.

3. Usage of Facilities, Laboratory Equipment, and Observation Equipment

Some of the facilities, laboratory equipment, and observation equipment managed by the Earthquake Research Institute are available for joint usage. Available items are listed in Appendix J-3. Those who wish to use the items should contact the contact person at the ERI for arrangement, and submit an application (Form J-1). It is necessary to submit another form, a specified items lease form (Form C-1), to take observation equipment outside the institute. If funds are required to use these facilities, please apply to the general research project instead.

A user of the item must submit a report (Form J-2) within 30 days of the completion of the usage of the items through the online web system.

4. Usage of Data and Records

Appendix J-4 is a list of earthquake and other earth science data and records, which are available for joint usage, managed by the Earthquake Research Institute. Those who wish to use them should contact the contact person of the data and records at the ERI for arrangement, and submit an application (Form J-1) by the online system. Applications to use the computer system database of the Earthquake Information Center are accepted by the Earthquake Information Center homepage below.

http://wwweic.eri.u-tokyo.ac.jp/computer/manual/eic2015/index.php?English

If funds are required to use these data and records, please apply to the general research project instead.

If you wish to receive national earthquake observation system data using satellite communications, please submit an equipment and facilities application (Form S-1). In addition, please submit reports (Forms J-2, S-2) within 30 days of the completion of the research using the data and records through the online web system.

Appendix T-2A-1　2017FY Specific Research Project (A) Titles

Project code Project title	○ Principle investigator ・ Contact Person at ERI	Details of the project and condition to participate in the project
2017-A-01 Earthquake and Volcano Hazards Observation and Research Program	○List of principal investigators is given in Appendix T-2A-2. ・Head of Coordination Center for Prediction Research of Earthquakes and Volcanic Eruptions	Earthquake and Volcano Hazards Observation and Research Program is a 5-year plan beginning in Fiscal Year 2014, based on a proposal in November, 2013, by the Council for Science and Technology (refer to the website; http://www.mext.go.jp/b_menu/shingi/gijyutu/gijyutu6/toushin/attach/1341570.htm). The program is composed of the four components as follows; 1. Research for elucidation of earthquakes and volcanic phenomenon, 2. Research for prediction of earthquakes and volcanic eruptions, 3. Research for inducement prediction of earthquake and volcanic eruption disasters, 4. Establishment and maintenance of promotion systems of observation and research. Researchers from 19 universities and (research) institutions across the country have been jointly conducting about 85 specific research projects under the components. Please consult Appendix T-2A-2 or the following URL for the respective projects; http://www.eri.u-tokyo.ac.jp/YOTIKYO/H29/project.html The Earthquake Research Institute will subsidize the expense of joining any of the projects listed in Appendix T-2A-2 for researcher(s) from universities or research institutes which do not participate in the Program. Those researcher(s) who wish to join a specific project should take contact with the Principal Investigator of the project, and submit the application form T-3A.
2017-A-02 Structure and dynamics of Earth's deep interior	○Daisuke Suetsugu（JAMSTEC） ・Hisashi Utada	This collaboration aims to reveal the structure and dynamics of the Earth's deep interior mainly by observational approach. We carry out long-term observation by geophysical network in the Pacific region (Ocean Hemisphere Network) and seismic and/or electromagnetic array studies both on land and seafloor, and contribute to the scientific aim by analyzing data from these observations.
2017-A-03 Science of Slow Earthquakes	○Kazushige Obara（Earthquake Research Institute） ・Yoshiyuki Tanaka	Our research will shed light on the mystery of “slow earthquakes”, which have been detected in succession in recent years. This will require an approach integrating the conventional fields of geophysics, seismology, and geodesy with materials science and non-equilibrium statistical physics, among others. By explaining the mechanisms, environmental conditions and principles of slow earthquakes, our goal is to accelerate a unified understanding of all earthquake events, from low-speed deformation to high-speed slip, and at the same time, to rebuild the way research is conducted on earthquakes. We collaborate with many researchers not only in Japan but also in various countries in the world in order to clarify (A) mechanisms involved in the occurrence of slow earthquakes, (B) environment in which slow earthquakes occur, and (C) principles by which slow earthquakes occur. We welcome research collaborators who are interested in this project (Appendix T-2A-3). If your proposal is accepted, a part of the travel fee will be supported. URL: http://www.eri.u-tokyo.ac.jp/project/sloweq/ Eligibility for application: Faculty members and researchers of national, public, and private universities, or national and public research institutions, and their equivalents are eligible to apply.

Appendix T-2A-2 2017-A-01 projects

Please consult the following URL for the respective projects
http://www.eri.u-tokyo.ac.jp/YOTIKYO/H29/project.html (In Japanese only)

課題番号	代表機関名	課題代表者	研究課題名
１． 地震・火山現象の解明のための研究 （１） 地震・火山現象に関する史料，考古データ，地質データ等の収集と整理			
1501	東大地震研	佐竹健治	地震・火山災害の関連史資料に基づく低頻度大規模災害の調査
1502	東大地震研	安田敦	揮発性成分定量による活火山爆発力ポテンシャル評価とマグマ溜まり深度の再決定
1901	京大防災研	加納靖之	史料の収集・翻刻・解析による過去の大地震および自然災害の調査
2601	東大史料編纂所	佐藤孝之	文献史料による歴史地震に関する情報の収集とデータベースの構築・公開
2701	新潟大災害・復興科学研究所	矢田俊文	日本海沿岸地域を中心とした地震・火山噴火災害関連史料の収集と分析
9001	奈良文化財研究所	小池伸彦	考古資料および文献資料からみた過去の地震・火山災害に関する情報の収集とデータベースの構築・公開
（２）低頻度大規模地震・火山現象の解明			
1001	北大理	中川光弘	地質および物質科学的データに基づく低頻度大規模火山現象およびその準備過程の研究
1002	北大理	谷岡勇市郎	北海道沖低頻度大規模地震の総合的理解とそのモニタリングへの基礎的研究
1503	東大地震研	篠原雅尚	日本海溝・相模トラフプレート境界で起こる多様なすべり現象の包括的モデル構築
1701	名大環境	山中佳子	古文書解読による南海トラフ巨大歴史地震像の解明
1902	京大防災研	中道治久	近代観測以降の大噴火時の観測データの整理と低頻度大規模噴火予知に寄与する情報の抽出
1903	京大防災研	岩田知孝	プレート境界巨大地震の広帯域震源過程に関する研究
（３）地震・火山噴火の発生場の解明			
1101	弘前大理工	小菅正裕	地殻流体と地震活動の関係及び過去地震の災害誘因の解明
1201	東北大理	東龍介	スラブ内地震の発生メカニズムの解明
1202	東北大理	三浦哲	蔵王山周辺の総合観測
1203	東北大理	松澤暢	地殻応答による断層への応力載荷過程の解明と予測
1401	東大理	角森史昭	地殻流体の連続化学観測にもとづいた地殻の状態評価システムの開発
1504	東大地震研	飯高隆	内陸地震発生の理解と予測に向けて
1505	東大地震研	岩崎貴哉	日本列島基本構造モデルの構築
1506	東大地震研	新谷昌人	小型絶対重力計を用いた火山監視技術の開発
1904	京大防災研	澁谷拓郎	南海トラフ巨大地震の予測高度化を目指したフィリピン海スラブ周辺域の構造研究
1905	京大防災研	飯尾能久	日本列島変動の基本場解明：地殻とマントルにおける物性、温度、応力、流動－変形

課題番号	代表機関名	課題代表者	研究課題名
1906	京大防災研	西上欽也	注水実験による内陸地震の震源断層の詳細な構造と回復過程の研究
1907	京大防災研	飯尾能久	横ずれ型の内陸地震発生の物理モデルの構築
2101	高知大理	大久保慎人	四国前弧域から中央構造線北方にかけての観測高度化による地震発生場の研究
2201	九大理	松本聡	地震・火山相互作用下の内陸地震・火山噴火発生場解明およびモデル化の研究
2301	鹿大理	八木原寛	海域と島嶼域における地震・地殻変動観測による南西諸島北部のプレート境界域テクトニクスの観測研究
2801	東大大気海洋研	朴進午	津波地震を励起する浅部プレート境界断層の実態解明と物性変動モニタリング
（４）地震現象のモデル化			
1204	東北大理	松澤暢	地震断層すべり物理モデルの構築
1507	東大地震研	中谷正生	次世代プレート境界地震発生モデル構築のための実験的・理論的研究
1801	京大理	平原和朗	地震サイクルシミュレーションの高度化
（５）火山現象のモデル化			
1003	北大理	橋本武志	多項目観測に基づく火山熱水系の構造の時空間変化の把握と異常現象の検知
1205	東北大理	中村美千彦	岩石組織に基づく火道浅部プロセスの推定手法の開発
1508	東大地震研	大湊隆雄	地球物理・地球化学統合多項目観測および比較研究によるマグマ噴火を主体とする火山の定量化とモデル化
1601	東工大理	野上健治	水蒸気爆発場の物理・化学状態の把握と火山流体の挙動
1602	東工大理	野上健治	海底火山活動の評価手法の開発に関する研究
1802	京大理	大倉敬宏	水蒸気噴火後の火山活動推移予測のための総合的研究　ー御嶽・口永良部・阿蘇ー
1908	京大防災研	井口正人	桜島火山におけるマグマ活動発展過程の研究
1909	京大防災研	大見士朗	焼岳火山の噴火準備過程の研究
2802	東大大気海洋研	佐野有司	地球物理・化学的探査による海底火山および海底熱水活動の調査
２．地震・火山現象の予測のための研究 （１）地震発生長期評価手法の高度化			
1702	名大環境	鈴木康弘	地表地震断層および活断層の地表形状・変位量データにもとづく直下型大地震の規模・頻度予測手法の高度化　ーLiDAR等の高解像度DEMを用いた検討
（２）モニタリングによる地震活動予測			
1206	東北大理	遠田晋次	地震活動の時空間パターンと断層および地震サイクルとの関係
1402	東大理	井出哲	地震発生場の階層性を考慮した地震活動予測
1509	東大地震研	小原一成	プレート境界すべり現象モニタリングに基づくプレート間カップリングの解明
1510	東大地震研	五十嵐俊博	相似地震再来特性の理解に基づく地殻活動モニタリング手法の構築
1511	東大地震研	鶴岡弘	地震活動に基づく地震発生予測検証実験

課題番号	代表機関名	課題代表者	研究課題名
1512	東大地震研	波多野恭弘	地震活動パラメターと地震発生場の応力の間に成り立つ定量的関係式
1703	名大環境	山岡耕春	南海トラフ域における巨大地震断層域の力学・変形特性の把握
1803	京大理	宮崎真一	実観測データに基づく断層面摩擦パラメータと地殻活動の状態推定の手法の構築
1910	京大防災研	西村卓也	短スパン伸縮計等を活用した西南日本における短期的SSEの観測解析手法の高度化
2401	立命館大総合理工	小笠原宏	南アフリカ金鉱山の地震発生場における応力・強度・ひずみ変化の現位置計測
（３）先行現象に基づく地震活動予測			
1207	東北大理	長濱裕幸	地震に先行する大気中ラドン濃度変動に関する観測
2402	立命館大総合理工	川方裕則	大規模地震・破壊に先行する極微小な前震活動の発生様式の特徴の解明
2501	東海大海洋研究所	長尾年恭	電磁気的地震先行現象の観測と統計評価による他種の先行現象との比較
（４）事象系統樹の高度化による火山噴火予測			
1004	北大理	中川光弘	噴火履歴及び観測事例に基づく噴火事象系統樹の試作
1208	東北大理	西村太志	観測事例及び理論予測に基づく噴火事象系統樹の分岐条件の検討
３．地震・火山噴火の災害誘因予測のための研究 （１）地震・火山噴火の災害事例の研究			
1513	東大地震研	佐竹健治	歴史時代に発生した地震・火山などの災害に関する多角的な研究
2702	新潟大災害・復興科学研究所	田村圭子	過去の災害事例に基づく減災科学に係る研究
（２）地震・火山噴火の災害発生機構の解明			
1514	東大地震研	酒井慎一	首都圏に被害を及ぼす地震の解明およびその被害の実像
1515	東大地震研	三宅弘恵	堆積平野・堆積盆地における地震災害発生機構の解明
1704	名大環境	黒田由彦	地震・津波災害に対する地域社会の脆弱性測定に基づくボトムアップ型コミュニティ防災・減災に関する文理融合的研究
（３）地震・火山噴火の災害誘因の事前評価手法の高度化			
1516	東大地震研	古村孝志	広帯域・高解像度強震動シミュレーションに基づく大地震の強震動評価の高度化
1911	京大防災研	関口春子	プレート境界巨大地震等の広帯域強震動予測に関する研究
1912	京大防災研	千木良雅弘	強震動によって発生する地すべり現象の発生ポテンシャル評価と事前予測手法の高度化
（４）地震・火山噴火の災害誘因の即時予測手法の高度化			
1005	北大理	谷岡勇市郎	津波浸水域の即時予測手法開発のための研究
1209	東北大理	太田雄策	トランジェント現象リアルタイムモニタリングのための複合測地データ利用の高度化
1913	京大防災研	井口正人	桜島火山におけるマグマ活動発展過程の研究－火山灰拡散即時予測
2001	鳥取大工	香川敬生	自治体震度計を用いた地震速報の高度化

課題番号	代表機関名	課題代表者	研究課題名
（５）地震・火山噴火の災害軽減のための情報の高度化			
1006	北大理	谷岡勇市郎	地理空間情報の総合的活用による災害に対する社会的脆弱性克服のための基礎研究
1517	東大地震研	纐纈一起	地震動・津波誘因の長期予測情報コミュニケーション
1914	京大防災研	井口正人	桜島火山におけるマグマ活動発展過程の研究－地域との連携
４．研究を推進するための体制の整備 （２）研究基盤の開発・整備			
1007	北大理	高橋浩晃	地殻変動等多項目観測データ全国リアルタイム流通一元化解析システムの開発
1008	北大理	村上亮	Lバンド航空機SARによる革新的火山観測手法の開発
1210	東北大理	木戸元之	海溝軸近傍で観測可能な海底地殻変動観測技術の開発
1403	東大理	森俊哉	噴火推移モニタリングのための火山ガス観測装置の開発
1518	東大地震研	鶴岡弘	データ流通網の高度化
1519	東大地震研	鶴岡弘	研究成果共有システムの構築
1520	東大地震研	金子隆之	衛星赤外画像による噴火推移の観測と類型化に関する研究
1521	東大地震研	塩原肇	海底での地震・地殻変動観測に向けた観測技術の高度化
1522	東大地震研	新谷昌人	光技術を利用した大深度ボアホール用地震地殻変動観測装置の開発
1523	東大地震研	田中宏幸	素粒子ミューオンを用いた火山透視技術の可用化プロジェクト
1705	名大環境	山岡耕春	精密制御震源システムの標準化と、ボアホール・海域への設置に関する研究
1915	京大防災研	飯尾能久	歴史記録の電子化
（５）社会との共通理解の醸成と災害教育			
1009	北大理	大島弘光	準リアルタイム火山情報表示システムの開発
1706	名大環境	田所敬一	火山災害情報およびその伝達方法のあり方
（６）国際共同研究・国際協力			
1524	東大地震研	望月公廣	日・米・NZ国際協力によるスロースリップでのプレート境界面断層滑りメカニズムの解明

Appendix T-2A-3　2017-A-03 Projects

	PI	Institution	Research project
A01	Kazushige Obara	ERI, Univ, Tokyo	Study on the mechanisms involved in the occurrence of slow earthquakes based on temporal inland and offshore observations
A02	Hitoshi Hirose	Kobe Univ.	Study on physical mechanisms of slow earthquakes based on geodetic observations
B01	Kimihiro Mochizuki	ERI, Univ, Tokyo	Study on seismic and electromagnetic subsurface structure around the source of slow earthquakes
B02	Kohtaro Ujiie	Univ. Tsukuba	Study on geological perspectives, frictional and hydrological properties of slow earthquakes
C01	Satoshi Ide	Univ, Tokyo	Study on geoscientific modeling of earthquake phenomena from low-speed deformation to high-speed slip
C02	Takahiro Hatano	ERI, Univ, Tokyo	Unified understanding of slow and regular earthquakes from nonequilibrium physics point of view

Appendix T-2B　2017FY Specific Research Project (B) Titles

Project code Project title	○ Principle investigator ・ Contact Person at ERI	Details of the project and condition to participate in the project
2015-B-01 New computational perspectives of the anatomy of seismograms	○Masahiro Kosuga（Hirosaki University） ・Takuto Maeda ・Kazushige Obara	Aim of the study: This study aims to strongly collaborate the observational and computational studies of seismic waves to promote the deeper understandings of the inhomogeneous structure in the lithosphere and related complicated behavior of seismic waves. Currently we can access high-quality seismic records for more than 10 years from dense seismic networks in Japan, however, we are not yet able to fully explain many seismic phases originated from the inhomogeneous structure. This research proposal, originally branched from the ERI's joint usage program, tackles the problem with the assistance of numerical simulation techniques and advanced computers to simulate three-dimensional seismic wave propagation. Thus what we are aiming at is the bridge between computational and observational seismology. A part of this research proposal (e.g., a symposium) will be held in collaboration with one of the joint usage program #2016-W-03. Conditions of participation: None Expected participating organizations: Hokkaido University, Hirosaki University, Tohoku University, Ibaraki University, University of Tokyo, Yokohama City University, Kyoto University, Kyushu University, National Research Institute for Earth Science and Disaster Resilience, Japan Agency for Marine-Earth Science and Technology, Association for the development of earthquake prediction
2015-B-02 Research on surface deformation using new generation SAR	○Taku Ozawa（NIED） ・Yosuke Aoki	Research content New generation Japanese SAR sat-ellite, ALOS-2, was launched on 24 May 2014. SAR sensor on ALOS-2 (sensor name: PALSAR-2) uses L-band radar which is useful on surface deformation measurement, and then worldwide researchers using SAR are hopeful to this mission. We have should utilize such useful SAR data and should generate many research products. We have established SAR research group (PIXEL) which has role of the research platform for surface deformation studies. In this group, we are sharing PALSAR and PALSAR-2 data which are provided based on ERI-JAXA research contract, and have obtained many fruitful results on seismology, volcanology, glaciolo-gy, and so on. Activity of PIXEL is based on the ERI specific research program (B), and then we apply this research proposal to continue this activity. Based on PIXEL shared data, we continue researches on surface de-formation for earthquake, volcanic activity, glacier, landslide, land subsidence, and so on. SAR analysis technique is also one of research targets in this research. Further-more, we manage a mailing list for information exchange and organize lecture of InSAR analysis. Expected participation institutes NIED, Univ. Tokyo, Hokkaido Univ., Tohoku Univ., Kanazawa, Univ., Ibaraki, Univ., Tokyo Metro. Univ., Nihon Univ., Shizuoka Univ., Nagoya Univ., Kyoto Univ., Kochi Univ., Univ. Kochi, Kyushu Univ., Tokai Univ., Kagoshima Univ., JAXA, AIST, CESS, TRIES, Hot Springs Res. Inst. Kanagawa Pref., NIPR, JMA, MRI, FGI

Project code Project title	○ Principle investigator ・ Contact Person at ERI	Details of the project and condition to participate in the project
2015-B-04 Geochemical data analysis of plate-boundary rocks using machine learning	○Tatsu Kuwatani (JAMSTEC) ・Hiromichi Nagao	This study aims to construct systematic data-driven analytical techniques in geochemistry by collaborations with information scientists. We welcome all geoscientists who are interested in data science and interdisciplinary collaborations. Affiliations of potential collaborators Hokkaido Univ., Tohoku Univ., Univ. Tokyo, TITEC, Tokoha Univ., Kanazawa Univ., Kagoshima Univ., Kitakyushu Museum, AIST, NIED, JAMSTEC.
2016-B-01 Pacific Array	○Hitoshi Kawakatsu（Earthquake Research Institute） ・Hisashi Utada	Recent advances in ocean bottom geophysical observations, together with advances in the analysis methodology, have enabled us to resolve regional 1-D structures of the lithosphere-asthenosphere system, from the surface to a depth of ~200km, including seismic azimuthal anisotropy, with deployments of ~10-15 BBOBSs & OBEMs each for a year or so. Pacific Array aims to deploy such an array of arrays in the Pacific ocean as an international collaborative research project. This research group will discuss how to make it happen. Those who wish to contribute to and/or to support PA is welcome to join. Expected institutes: JAMSTEC, Hokkaido U, Kobe U & Tokyo U, ERI.
2016-B-03 Developing monitoring methods for volcano infrasound	○Mie Ichihara（Earthquake Research Institute） ・Mie Ichihara	We are aiming at improving the performance and reliability of infrasonic sensors used for monitoring of volcanoes. In collaboration between manufacturers and users of infrasound sensors, we examine the responses of different sensors and exchange information. Expected collaborators are from Nagoya University, Kyoto University, Kyushu University, Kochi University of Technology, NEID, JMA, MRI, JWA, Firenze University, Hawaii University.
2016-B-04 Establishment of Global Muography Network	○Hiroyuki Tanaka（Earthquake Research Institute） ・Hiroyuki Tanaka	The Global Muography Network (GMN) is a new framework for muography researchers, created in order for participating countries to share muographic observational detectors, muography technologies and muography researchers. The goal of GMN is to extend a new academic field, “internationally” by establishing “Muography (a visualization technique for imaging the internal structures of gigantic objects such as volcanoes with elementary particles called muons)”, as a core technology, strengthening the existing cooperation with domestic institutions, forming a global network of researchers and enabling the increased practical applications of muography technology. In particular, this network will connect each project progressing currently at home and abroad, and by promoting research partnership with domestic and foreign institutions which have succeeded in acquiring research budgets in the fields related to muography, we will expand bilateral partnerships into the global network. Moreover, we aim to create new industries based on the results of these international research partnerships, by utilizing coherent efforts and the synergistic effects of combining the expertise of physicists specializing in elementary particles and those specializing in earth physics. List of affiliations for projected participants: Istituto Nazionale di Fisica Nucleare, Istituto Nazionale di Geofisica e Vulcanologia, MTA Wigner Fizikai Kutatóközpont küldetése, The Institut national de physique nucléaire et de physique des particules, Université catholique de Louvain, University of Sheffield, Durham University, Université Nice Sophia Antipolis, Istituto nazionale di astrofisica, Pacific Northwest National Laboratory, Nagoya University, High Energy Accelerator Research Organization, International Research Center for Japanese Studies, Università degli Studi di Salerno, Università degli Studi di Napoli Federico II, Università degli Studi di Firenze.

Project code Project title	○ Principle investigator ・ Contact Person at ERI	Details of the project and condition to participate in the project
2016-B-05 Synthesis of standard polycrystalline minerals for room experiments	○Takehiko Hiraga（Earthquake Research Institute） ・Takehiko Hiraga	Collaboration with a powder processing group at National Institute of Material Science (NIMS), we will synthesize ideal mineral aggregates for room experiments. The materials will be used by numbers of different groups which are expert on the measurement of physical properties at a wide range of temperature and pressure conditions. Planned research group for this program: Tohoku University, University of Tokyo, NIMS, Okayama University, Yokohama University, Ehime University, Kyushu University University of Minnesota, University of Bayreuth, University of Montpelier,
2016-B-07 Physical mechanism for sensitive response of earthquake faults to stress perturbation	○Takahiro Hatano（Earthquake Research Institute） ・Takahiro Hatano	Earthquake faults may be sensitive to faint stress perturbation as illustrated in dynamic triggering and correlation to tides. While tectonic tremors are always sensitive to tides, earthquakes are not always so except in the close vicinity of the rupture initiation point prior to giant earthquakes. At this stage, little is known about the physical mechanism of these phenomena and therefore intensive studies are needed. In this project, we call for researchers who tackle this problem by means of laboratory experiments and theoretical modeling. Unified understanding should be attempted for these (apparently) various phenomena as the sensitivity to stress perturbation in a wide range of frequencies and amplitudes. In particular, elementary physical processes should be investigated such as the mechanical responses of fault gouge or rocks to stress perturbations. We also call for the collaboration with experts on statistics to account for the observed seismicity.
2016-B-08 Advanced gravimetry and its application to observational geosciences	○Kazunari Nawa（AIST） ・Yuichi Imanishi	Gravimetry is a powerful tool for tracking spatiotemporal changes in density distributions, and is expected to play an important role in monitoring tectonic activities such as the large-scale crustal deformations of the Japanese islands after the 2011 Tohoku Earthquake. In addition to the ground-based gravity measurements based on traditional methods (absolute gravimeter, spring-type gravimeter, superconducting gravimeter), satellite methods are providing new aspects in observational gravimetry. Also, instrumental developments based on brand-new principles are now in progress for measurements of spatial derivatives or integrals of gravity acceleration. This study aims at integrating these recent advances toward applications to a wide variety of geosciences.
2016-B-09 Crustal Deformation Research by Dense GNSS Array Campaign Observation	○Takeshi Matsushima（Kyushu University） ・Teruyuki kato	Staff and students of Universities and research institutions in Japan that specializes in Geodesy will hold dense GNSS campaign observation research. The observation was held by more than 40 researchers in Miyakejima volcano in 2016. The next observation will be held in and around Ito city, Shizuoka prefecture where the campaign observation had been repeated in the 1990s. The observation of 2018-campaign will be held in Niigata area. We will research crustal deformation of these areas occurred after the previous studies. Another major objective of these campaign observations is to educate and exchange between students and young researchers and to pass on outdoor observation technique. In addition, we will assemble the past observation data and record of observation point, summarized as a database. Universities and research institutes that participate is assumed: Hokkaido Univ., Tohoku Univ., Yamagata Univ., Univ. of Tokyo, Shizuoka Univ., Kyoto Univ., Nagoya Univ., Kobe Univ., Kochi Univ., Kyushu Univ., Kagoshima Univ., Nihon Univ., Tokai Univ., NEID, AIST, MRI, Hot Springs Res. Inst. of Kanagawa Pref., JAMSTEC, and etc.

Project code Project title	○ Principle investigator ・ Contact Person at ERI	Details of the project and condition to participate in the project
2016-B-11 Development of data assimilation methods applicable to simulation models and observation data in solid-earth science	○Kosuke Ito（University of the Ryukyus） ・Junichi Fukuda	Estimating state variables and model parameters in numerical simulation models quantitatively is crucially important to elucidate mechanisms of various phenomena in solid-earth science and to forecast their time evolution. For this purpose, we need data assimilation methods in which state variables and model parameters in simulation models are estimated on the basis of Bayesian statistics and optimization theories. Data assimilation methods have been developed and studied extensively in atmospheric, ocean, and statistical sciences. In recent years, data assimilation methods have also been applied to several problems in solid-earth science such as GPS data assimilation into numerical models of fault slip evolution and assimilation of seismicity data. To further advance data assimilation studies in solid-earth science, it is necessary to develop methods that are applicable to models with high nonlinearity and high degrees of freedom. In this project, researchers from atmospheric, ocean, and statistical sciences, who are familiar with data assimilation methods, and researchers from solid-earth science, who are familiar with simulation models and observation data, will collaborate together to develop data assimilation methods that are applicable to the numerical models of fault slip evolution. We will also develop data assimilation methods for other simulation models in solid-earth science, such as models for seismicity evolution and volcanic activity.
2016-B-12 Monitoring of crustal activity with precise strain observation network	○Akito Araya（Earthquake Research Institute） ・Akito Araya ・Teruyuki Kato	For earthquake and volcanic observations, records from observation networks of seismometer and GNSS are widely used. On the other hand, data of strainmeters have not fully been utilized mainly because of their sensitivity to local noise and incomplete networking. Nevertheless, their superior resolution to the crustal deformation with seamless timescale, from dc to high frequencies, would be useful for understanding various kinds of crustal activity especially after the 2011 Tohoku earthquake. The 100-m-class laser strainmeters (Funagira and Kamioka) have detected slow slip events and far-field coseismic crustal deformation that cannot be detected by seismometers and GNSS, and in Kamioka a new laser strainmeter with 1500-m baseline has been constructed. In Tono and Tokai areas, a borehole-strainmeter network has been formed, and the countrywide data distribution including extensometer data is available. The purpose of this research is to treat various kinds of strain data with integrative approach to extract common signal that can be compiled as temporal and spatial crustal activities. In addition, advanced technologies that may lead to new strain observation will be discussed in the workshop. Researchers who are interested in observations and analyses on crustal activity as well as new related technologies are expected to participate in this research. Participating organizations: Tokyo Univ., MRI, TRIES, AIST, Hokkaido Univ., Tohoku Univ., Tokai Univ., Nagaoka Univ. of Tech., Nagoya Univ., Kyoto Univ., Kochi Univ.

Project code Project title	○ Principle investigator ・ Contact Person at ERI	Details of the project and condition to participate in the project
2016-B-13 Modeling relative motion along the plate interface around the slow-slip region in the Hikurangi subduction zone	○Motoyuki Kido （Tohoku University） ・Kimihiro Mochizuki	It is important to grasp the behavior of the plate interface for understanding earthquake generation mechanisms. After discovery of slow slip within the coupling transition zone between locked and stably sliding regions, many studies on frictional properties in and around the seismogenic zone have been conducted. Slow slip of M~6.5 has repeatedly occurred at intervals of 1 ~ 2 years along the eastern coast of the North Island of New Zealand. Depth to the plate interface is shallow, and the structure of the plate interface has been well resolved by seismic surveys. We conducted marine seismic and seafloor-vertical-motion observations using ocean bottom seismometers and pressure gauges, and successfully observed a large slow slip event during 2014 and 2015. We plan to continue our marine observations with additional GPS/A instruments to detect horizontal motion on the seafloor under the framework of JPN-NZ-USA collaborative researches for modeling behavior of the plate interface through a sequence from strain accumulation to an occurrence of slow slip event. International Research Institute of Disaster Science, Tohoku University Research Center for Prediction of Earthquakes and Volcanic Eruptions, Graduate School of Science, Tohoku University Disaster Prevention Research Institute, Kyoto University Earthquake Research Institute, the University of Tokyo Faculty of Science, University of Ryukyus Faculty of Science, Hiroshima University Kobe Ocean Bottom Exploration Center, Kobe University Japan Agency for Marine-Earth Science and Technology GNS Science Institute for Geophysics, The University of Texas at Austin Scripps Institution of Oceanography, UC San Diego
2017-B-01 Developing a numerical method simulating magma fracture	○Masaharu Kameda （Tokyo University of Agriculture and Technology ） ・Mie Ichihara	Deformation and fracture of visco-elastic fluid is an important process controlling a volcanic eruption. The phenomenon includes interesting problems in computational science for continuum mechanics. Developing a mathematical model and numerical methods to solve the problems will bring about a breakthrough not only in volcanology but also in engineering. In this project, we develop a numerical method to simulate fracture of visco-elastic fluid using the brittleness parameter presented by Ichihara and Rubin (2010). We also conduct fracture experiment on viscoelastic fluid to test the numerical method. Possible collaborators: Akinori Yamanaka (TUAT) Osamu Kuwano (JAMSTEC) Satoshi Okumura (Tohoku University) Hiromichi Nagao (ERI)

Project code Project title	○ Principle investigator ・ Contact Person at ERI	Details of the project and condition to participate in the project
2017-B-02 Image analysis of muography applying medical computer-assisted detection/diagnosis (CAD) technology	○Naoto Hayashi（the University of Tokyo Hospital） ・Hiroyuki Tanaka	High-speed computer-assisted image diagnostic technology applying machine learning have been developed in Department of Computational Diagnostic Radiology and Preventive Medicine, The University of Tokyo Hospital. Meanwhile, muographic visualization of a volcano's internal structure has been demonstrated to the rest of the world by Earthquake Research Institute, The University of Tokyo. This project aims to combine computer-assisted image diagnostic technology with muography to facilitate observation of eruption style and process, and accelerate research of the volcano. Muography visualizes density distribution of the object by measuring the direction and number of muons that pass through it. Although muography is expected to be useful to understand the internal structure of volcanoes, it has not been sufficiently utilized in connection with volcanic activity. That was because analysis of muon track information more than ten million per year has took time, and tens of thousands of muographic images has not been evaluated. In the medical field, advanced technology has been developed to demonstrate and analyze medical images including radiography, computed tomography (CT), magnetic resonance imaging (MRI), and positron emission tomography (PET). Recently, the number of images per medical examination has exponentially increased, and it causes increase of burden on physicians who read images to detect and diagnose lesions. To support physicians, software has been developed to reconstruct and analyze images, and demonstrate lesion candidates. Moreover, machine learning has been applied to improve its accuracy. Both muography and medical imaging technology including radiography aims to utilize track information of radiation or elementary particles to detect abnormality (lesion) inside the target and evaluate it qualitatively. This project aims to combine advanced medical image diagnostic technology with muography to develop high-speed volcano diagnostic technology. In fiscal year 2017, we will observe Sakurajima, analyze its data applying computer-assisted detection/diagnosis technology, and facilitate observation of eruption style and process to promote research of the volcano. Furthermore, we will improve accuracy of prediction of eruption time and scale to utilize disaster prevention. Expected members of the reseaarch project Department of Computational Radiology and Preventive Medicine, The University of Tokyo Hospital Department of Radiology, The University of Tokyo Hospital Faculty of Information Sciences and Graduate School of Information Sciences, Hiroshima City University
2017-B-03 Research on Seismicity and Plate Structure by the Metropolitan Seismic Observation Network (MeSO-net)	○Hisanori Kimura（NIED） ・Naoshi Hirata	Metropolitan Seismic Observation Network (MeSO-net) is a dense, widely distributed seismograph network, which is unique in the world. In this project, we will conduct a research, which advances understanding of the seismotectonics beneath the metropolitan area, and contributes to decision making on disaster mitigation policy over the whole metropolitan area, by using data obtained from MeSO-net. affiliations for projected participants in the project: Earthquake Research Institute National Research Institute for Earth Science and Disaster Resilience Hot Springs Research Institute

Project code Project title	○ Principle investigator ・ Contact Person at ERI	Details of the project and condition to participate in the project
2017-B-04 Development of muography technologies using nuclear emulsion	○Kunihiro Morishima（Nagoya University） ・Hiroyuki Tanaka	Muography is the non-destructive inspection technology of the giant objects. By using muography, we can take transmission images of volcanoes. And also, density change inside of mountains can be imaged. Nuclear emulsion is a muon detector. Nuclear emulsion is high sensitive photographic film, which can record three dimensional trajectories of muons with high space resolution. Thus, Nuclear emulsion is no need of electric power. This is advantage for applying to volcanoes. In this study, It is planned to develop technologies of high-speed analysis system of nuclear emulsion for muongraphy of volcanoes. Nagoya University, Tokyo University, Kobe University, Toho University, Gifu University, Central Research Institute of Electric Power Industry, Salerno University, Cairo University, Bern University
2017-B-05 Understanding of deep Earth using directionally sensitive large detectior	○Kunio Inoue（Tohoku University） ・Hiroyuki Tanaka	A cooperative research program promoted in FY 2014-2016 (title : Development of small-size detector for anti-neutrino directionality and construction of “Particle Geoscience”) advanced fundamental research toward establishment of new technology and put a calculation model of geo-neutrino flux into shape by furthering connections between geology and particle physics communities. The next step is for our cooperative research to definitize what we can do for understanding the Earth by combination of our accomplished research progresses and unique outputs can be expected. Our research aims to measure an angler resolution of directional measurement. Based on the measurement result, we will construct angle-dependent geo-neutrino flux model and evaluate the measurement sensitivity assuming realistic large detector. Our research project is directed toward a better understanding of next-generation targets such as separate measurement of the crust and mantle geo-neutrino contributions and clarifying the sensitivity of LLSVP. “Particle Geoscience” can be built on our achievements. Affiliation of Possible Participate： Tohoku University, University of Tokyo, Tokyo Institute of Technology, JAMSTEC, National Institute of Advanced Industrial Science and Technology
2017-B-06 Construction of overriding plate deformation in subduction zones	○Hiroshi Sato（Earthquake Research Institute) ・Hiroshi Sato ・Tatsuya Ishiyama	Our goal is to construct community block models of Japanese Islands including seismic source fault models and three dimensional crust and mantle rheology models based on seismic tomography, elastic wave velocity experiments, and structural and thermal evolution of Japanese islands. Our purpose also includes comparison between these models with a long-term crustal deformation. We expect participants from Iwate, Tohoku, Niigata, Yokohama National, Aichi Educational, Chubu, Kyoto Universities, NIED, and JAMSTEC.

Appendix T-2C　2017FY Specific Research Project (C) Titles

Project code Project title	○ Principle investigator ・ Contact Person at ERI	Details of the project and condition to participate in the project
2017-C-01 Research of earthquakes and volcanoes based on Disaster Prevention Research Forum	○Head of Coordination Center for Prediction Research of Earthquakes and Volcanic Eruptions（Earthquake Research Institute） ・Head of Coordination Center for Prediction Research of Earthquakes and Volcanic Eruptions	Cooperative research based on Disaster Prevention Research Forum, which was established by Earthquake Research Institute, Disaster Prevention Research Institute, Kyoto University, and National Research Institute for Earth Science and Disaster Resilience. When large earthquake or volcanic eruption occurs, an advance research team is sent to the field.

Appendix J-3

List of facilities, observation equipment, and laboratory equipment（FY 2017）

Please Refer the detailed list at Joint usage page

（http://www.eri.u-tokyo.ac.jp/en/wp-content/uploads/sites/2/2016/09/H29_J-3_E.pdf）

(facilities)

Joint Usage Code and Name of facility/equipment	Information of facility	Contact person (○Responsible person)	Conditions of Use and Remarks	Application periods
2017-F1-01 Tsukuba Seismological Observatory Aburatsubo Geophysical Observatory Nokogiriyama Geophysical Observatory Wakayama Seismological Observatory Hiroshima Seismological Observatory Yahiko Geophysical Observatory Dodaira Seismological Observatory Shin-etsu Seismological Observatory Fujigawa Geophysical Observatory Muroto Geophysical Observatory Observatories and facilities	Nokogiriyama： http://eoc.eri.u-tokyo.ac.jp/GOP/ngy.html (In Japanese only) Wakayama： http://www.eri.u-tokyo.ac.jp/WSO/index.html (In Japanese only) Fujigawa： http://www.eri.u-tokyo.ac.jp/fujigawa/indexJ.html (In Japanese only) Muroto： http://eoc.eri.u-tokyo.ac.jp/GOP/Mrt/indexM.html (In Japanese only)	○Head of Center for Geophysical Observation and Instrumentation	Must contact with the responsible person prior to the application.	Any time, as needed.
2017-F1-02 Yatsugatake Geo-electromagnetic Observatory		○OGAWA Tsutomu	Must contact with the responsible person prior to the application.	Any time, as needed.
2017-F1-03 Asama Volcano Observatory Komoro observatory of Seismology and Volcanology Izu-Oshima Volcano Observatory Kirishima Volcano Observatory		○Head of Center for Geophysical Observation and Instrumentation	Must contact with the responsible person prior to the application.	Any time, as needed.

(observation equipment)

Joint Usage Code and Name of facility/equipment	Information of Equipment	Contact person (○Responsible person)	Conditions of Use and Remarks	Application periods
2017-F2-01 Data receiver system by satellite communication for a nation-wide seismic telemetry network.	http://eoc.eri.u-tokyo.ac.jp/eisei_system/riyou/data_jushin_riyou.htm (In Japanese only)	○SAKAI Shinichi	Must contact with the responsible person prior to the application. It is a rule that the users install it and maintain it by themselves. Another application about data use is needed.	Any time, as needed.
2017-F2-02 Temporal seismic data acquisition systems (incl. data transfer units, seismometers and recording units)	http://eoc.eri.u-tokyo.ac.jp/eisei_system/riyou/vsat_riyou.htm (In Japanese only) http://eoc.eri.u-tokyo.ac.jp/eisei_system/riyou/chijo_souti.htm (In Japanese only)	○SAKAI Shinichi, IWASAKI Takaya	Must contact with the responsible person prior to the application. Not always available for period of specific research projects.	Any time, as needed.
2017-F2-03 GPS observation equipments: 27 sets	JAVAD GPS receiver: SIGMA-G2T JAVAD GPS antenna: GrAnt-G3T	○KATO Teruyuki	Contact to the responsible person before application is required. Joint usage is subject to forced termination due to any urgent occasions.	Any time, as needed.
2017-F2-04 Broadband-MT instruments	Metronix 1) Main unit: ADU07 8 sets ADU07e 11 sets 2) Induction coils MFS06: 24 coils MFS07: 4 coils MFS06e: 12 coils MFS07e: 21 coils Phoenix 1) induction coils MTC50 3 coils Basically, 5 component data (2-component E-field and 3-component H-field) can be measured. Sample frequency is 2^n Hz up to 524 kHz. In addition, we have some other items necessary to the MT survey, such as, various batteries and electrodes.	○UYESHIMA Makoto	Must contact with the responsible person prior to the application. Please recognize that we cannot let you use the instruments if we have some field campaigns. If you are benefitted with this service, please do not fail to acknowledge the ERI's Joint Usages in your presentations, reports or papers.	Any time, as needed.
2017-F2-05 Network-MT voltage difference measurement system	SES93: 8 channel 20 bit voltage difference acquisition systems developed by ADOSYSTEMS. We have about 20 instruments. Sampling interval is 0.1, 1 or 10 s. SESNET93: Data transfer units.	○UYESHIMA Makoto	Must contact with the responsible person prior to the application. Please recognize that we cannot let you use the instruments if we have some field campaigns. If you are benefitted with this service, please do not fail to acknowledge the ERI's Joint Usages in your presentations, reports or papers.	Any time, as needed.

Joint Usage Code and Name of facility/equipment	Information of Equipment	Contact person (○Responsible person)	Conditions of Use and Remarks	Application periods
2017-F2-06※ Marine heat flow measurement system	The system consists of a data logger, probes, temperature sensors, weight, and an acoustic pinger. Heat flow is measured by penetrating a probe equipped with multiple temperature sensors into seafloor sediment. An instrument for thermal conductivity measurement on sediment samples (Quick Thermal Conductivity Meter, Kyoto Electronics Manufacturing Co., Ltd.) is also available.	○YAMANO Makoto	Users must have an experience in marine heat flow measurement, unless they conduct cooperative research with the Earthquake Research Institute.	Any time, as needed.
2017-F2-07 Portable broadband seismic observation system (1)	Broadband seismometers: CMG3T,STS2 Recorders: REKTEK130 40 sets	○KAWAKATSU Hitoshi	Data have to become open in public at the data center of OHRC, ERI after 2-3 years of moratorium period. For the system availability, consult with the contact person.	Any time, as needed.
2017-F2-08 Portable broadband seismic observation system (2)	Broadband seismometers (Nanometrics Inc., Canada) Trillium 120PA Number of equipment: 14	○OIKAWA Jun	Must contact with the responsible person prior to the application.	Any time, as needed.
2017-F2-09※ Absolute gravimeter	FG5 gravimeter with 1-2 microgal accuracy manufactured by microg-Lacoste corp., U.S.A.	○OKUBO Shuhei	Must contact with the responsible person prior to the application.	Any time, as needed.
2017-F2-10※ Lacoste & Romberg Land gravimeter	Spring gravimeter with 10 microgal accuracy manufactured by microg-Lacoste corp., U.S.A.	○OKUBO Shuhei	Operational instruction should be understood.	Any time, as needed.
2017-F2-11※ Potable strong motion observation system	Potable strong motion observation system (Revision of SMAR-6A3P) 16 equipment with amplifier (16 JEP-6A3P sensors with 1V/G) (Akashi Corporation) 5 equipment without amplifier (5 JEP-6A3P sensors with 10V/G) (Akashi Corporation) 10 logger LS-7000XT (Hakusan Corporation) 10 logger LS-7000 (Hakusan Corporation) ※A single set consists of an equipment and a logger. ※20 sets are available. ※Amplifier gain is a multiplication of 1, 20, 50, 100 and 0.1, 1, 10, 100.	○KOKETSU Kazuki	Must contact with the responsible person prior to the application. Need to acknowledge in the publications. Need to send a copy of the publication.	Any time, as needed.
2017-F2-12 Volcanic gas observation system		○OIKAWA Jun	Must contact with the responsible person prior to the application.	Any time, as needed.

Joint Usage Code and Name of facility/equipment	Information of Equipment	Contact person (○Responsible person)	Conditions of Use and Remarks	Application periods
2017-F2-13 Ultra-long period MT instruments	LEMI-417 fluxgate MT observation instruments. We have 6 instruments. 4 component E-fields and 3-component H-fields can be measured with 1s sampling.	○UYESHIMA Makoto, SHIMIZU Hisayoshi	Must contact with the responsible person prior to the application. Please recognize that we cannot let you use the instruments if we have some field campaigns. If you are benefitted with this service, please do not fail to acknowledge the ERI's Joint Usages in your presentations, reports or papers.	Any time, as needed.
2017-F2-14 High accuracy gyro-compass system	A SOKIA's GP1X manual gyro-compass system. Measurement accuracy is 20 angle-seconds.	○UYESHIMA Makoto, SHIMIZU Hisayoshi	Must contact with the responsible person prior to the application. If you are benefitted with this service, please do not fail to acknowledge the ERI's Joint Usages in your presentations, reports or papers.	Any time, as needed.
2017-F2-15※ 3D deep-sea current profiler system	NORTEK Aquadopp - 6000 m 1 system (http://www.nortek-as.com/en/products/CurrentMeter/Aquadopp6k) A current profiling system by combination of the Doppler current profiler (Aquadopp) and the Ti sphere transponder system of a self pop-up recovery, which enables 10 s interval observation of more than one-year-long by the external power supply. Use of the current profiler only is also available.	○SHIOBARA Hajime	Must contact with the responsible person prior to the application.	Any time, as needed.
2017-F2-16 High accuracy broad-band voltage difference measurement instruments	NT System Design's Elog1k. We can measure 2-component voltage differences at 1024Hz or 32 Hz with 24 bit accuracy. Very low power consumption (1.8W).	○UYESHIMA Makoto,	Must contact with the responsible person prior to the application. If you are benefitted with this service, please do not fail to acknowledge the ERI's Joint Usages in your presentations, reports or papers.	Any time, as needed.
2017-M-01 Specific equipment・Seismometers (1Hz, Lennarz electronic GmbH)	LE-3Dlite MkII 20 sets	○Center for Geophysical Observation and Instrumentation	Normal usage period (less than 2 months) Application required for longer usage in June.	Any time, as needed.
2017-M-02 Specific equipment・Broad-band seismometers	Trillium-120PA 6 sets	○Center for Geophysical Observation and Instrumentation	Normal usage period (less than 2 months) Application required for longer usage in June.	Any time, as needed.

Joint Usage Code and Name of facility/equipment	Information of Equipment	Contact person (○Responsible person)	Conditions of Use and Remarks	Application periods
2017-M-03 Specific equipment・Low electric power data recording units	HKS-9700a-0505　20 sets	○Center for Geophysical Observation and Instrumentation	Normal usage period (less than 2 months) Application required for longer usage in June.	Any time, as needed.
2017-M-04 Specific equipment・Centaur data recording units	6 sets	○Center for Geophysical Observation and Instrumentation	Normal usage period (less than 2 months) Application required for longer usage in June.	Any time, as needed.
2017-M-05 Specific equipment・ Broad-band seismometers	TS17840/Trillium-120PA 9 sets	○Center for Geophysical Observation and Instrumentation	Normal usage period (less than 2 months) Application required for longer usage in June.	Any time, as needed.
2017-M-06 Specific equipment・ Seismic/volcanic observation units	LF-1100R/LF-2100R　9 sets	○Center for Geophysical Observation and Instrumentation	Normal usage period (less than 2 months) Application required for longer usage in June.	Any time, as needed.

(laboratory equipment)

Joint Usage Code and Name of facility/equipment	Information of Equipment	Contact person (○Responsible person)	Conditions of Use and Remarks	Application periods
2017-F3-01 Controlled Seismic source		○SATO Hiroshi, ISHIYAMA Tatsuya	Users are required to have precise and detailed knowledges on how to use the controlled Seismic source.	Any time, as needed.
2017-F3-02 Computer system of Earthquake and Volcano Information Center	http://wwweic.eri.u-tokyo.ac.jp/computer/manual/eic2015/index.php?English	○Head of Earthquake and Volcano Information Center	Limited to academic use and along with the purpose of ERI, according to the rule. Apply directly to ERI, if joint usage fund is not needed.	Any time, as needed.
2017-F3-03 Rock Fracture Apparatus with Data Acquisition System	http://www.eri.u-tokyo.ac.jp/gijyutsubu/jikken/ (In Japanese only)	○YOSHIDAS hingo, NAKATANI Masao	Must contact with the responsible person prior to the application.	Any time, as needed.
2017-F3-05 XRF spectrometer	RIGAKU Wavelength dispersive-X-ray fluorescence spectrometer ZSX Primus II http://www.rigaku.com/en/products/xrf/primus2	○NAKADA Setsuya, YASUDA Atsushi	All users were requested to receive instruction beforehand upon contact to responsible persons. Consumables were　users' pocket.	
2017-F3-06※ Vibration testing system	EMIC Corp. Vibration testing system F-1400BD/LAS15 Horizontal or vertical shaking table (1-axis)	○ARAYA Akito	Must contact with the responsible person prior to the application. Operate the equipment by yourself in principle.	Any time, as needed.
2017-F3-07※ Laser source equipment	NEOARK Corp. Frequency　stabilized He-Ne laser Emission wavelength 633nm (red light)	○ARAYA Akito	Must contact with the responsible person prior to the application.	Any time, as needed.

Joint Usage Code and Name of facility/equipment	Information of Equipment	Contact person (○Responsible person)	Conditions of Use and Remarks	Application periods
2017-F3-08 National Seismogram Data System		○Head of Earthquake and Volcano Information Center	System to use national seismogram data, jointly operated with Japanese universities. Consult with corresponding faculty.	Any time, as needed.
2017-F3-09 Karl Fischer moisture titrator (Coulometric titration)	Kyoto Electronics Manufacturing Co., Ltd. Karl Fischer moisture titrator (Coulometric titration) ＜MKC-610＞ http://www.kyoto-kem.com/en/product-category/karl/ Evaporator for measurement of water in rocks ＜ADP-512＞ http://www.kyoto-kem.com/en/product-category/option-karl/	○NAKADA Setsuya, MIBE Kenji	All users must be trained before operating the machine. It is requested that all applicants discuss their projects with contact person before submitting the proposal. The chemicals for measurements have to be purchased by users.	Any time, as needed.
2017-F3-10 Laser diffraction particle-size analyzer (wet dispersion condition)	Sympatec HELOS/KF-RODOS-QUIXEL System http://www.sympatec.com/EN/LaserDiffraction/f-series/HELOS.html	○NAKADA Setsuya, MAENO Fukashi	All users are required to receive instruction from contact persons and to adjust schedule.	Any time, as needed.
2017-F3-11※ Equipment set for thermometer calibration	Fluke 1586A, 9142, 7103 etc. Thermostatic bath (-30 degC to 150 degC), thermistor scanner, and so on	○NAKATANI Masao	Must contact with the responsible person prior to the application. Operate the equipment by yourself in principle.	Any time, as needed

※Detailed information posted at Earthquake Research Institute official web site, joint usage page.

Appendix J-4
List of earthquake and other earth science data and records（FY 2017）

Please also refer the our database page (http://www.eri.u-tokyo.ac.jp/en/publication/)/

Joint Usage Code and Name of data/ records	Contact person （○Responsible person）	Conditions of Use and Related URL	Application periods
2017-D-01 WWSSN Seismogram microfiche	○Head of Committee for old seismograms and mareograms	Advance appointment required. Inquire about paper supplies. http://wwweic.eri.u-tokyo.ac.jp/wwssn/filmlist.html	Any time, as needed.
2017-D-02 Historical seismograms	○Head of Committee for old seismograms and mareograms	Use microfiche archives. Original records can be used with ERI staff. http://wwweic.eri.u-tokyo.ac.jp/susu/	Any time, as needed.
2017-D-03 Seismological Bulletin, Selected newspaper articles, Foreign seismological reports	○Head of Committee for old seismograms and mareograms	Copies can be made in library. Bulletins: http://wwweic.eri.u-tokyo.ac.jp/record-J/index.html Foreign seismological reports: http://wwweic.eri.u-tokyo.ac.jp/record-W/index.html	Any time, as needed.
2017-D-04 Earthquake data of Center for Geophysical Observation and Instrumentation	○Head of Center for Geophysical Observation and Instrumentation	Contact to responsible person. Data should be used under the treatment of earthquake data of Japanese universities. http://eoc.eri.u-tokyo.ac.jp/harvest/	Any time, as needed.
2017-D-05 Nation-wide earthquake data transfer by satellite communication system and other facilities	○Head of Center for Geophysical Observation and Instrumentation	Application required under the treatment on earthquake data transfer by satellite communication system. http://eoc.eri.u-tokyo.ac.jp/eisei_system/riyou/data_jushin_riyou.htm	Any time, as needed.
2017-D-06 Japan University Network Earthquake Catalog (JUNEC)	○Head of Earthquake and Volcano Information Center	Hypocenter data can be accessed through anonymous ftp. ftp://ftp.eri.u-tokyo.ac.jp/pub/data/junec/ Arrival time data can be provided by CD, according to rule among the universities. Application form should be submitted and the usage should be acknowledged.	Any time, as needed.
2017-D-07 Seismic data of Asama, Azu-Oshima, Kirishima, and Fuji volcanoes	○Head of Volcano Research Center	Must contact with the responsible person prior to the application.	Any time, as needed.
2017-D-08 Broadband Seismic Waveform Data (1)	○Head of Ocean Hemisphere Research Center	none. http://ohpdmc.eri.u-tokyo.ac.jp/dataset/permanent/seismological/index.html	Any time, as needed.
2017-D-09 Broadband seismic waveform data (2)	○TAKANO Kiyoshi	Broadband seismic waveform data recorded in ERIOS system for broadband seismometer of Tsukuba and Shiraki stations. Since the recording period for each observation station was different, please consult the person in charge prior to the time of use desired. Data format is the ERIOS format.	Any time, as needed.

Joint Usage Code and Name of data/ records	Contact person (○Responsible person)	Conditions of Use and Related URL	Application periods
2017-D-10 New J-array seismogram data	○Head of Earthquake and Volcano Information Center	Can be used through website. http://jarray.eri.u-tokyo.ac.jp/ Usage should be acknowledged.	Any time, as needed.
2017-D-11 Earthquake data in Nikko region, Northern Kanto, Japan, in 1993	○Head of Center for Geophysical Observation and Instrumentation	Treatment of data usage by participants of the 1993 Nikko seismic observation.	Any time, as needed.
2017-D-12 Strong motion observation database (mainly Suruga bay, Izu peninsula, and Ashigara valley)	○KOKETSU Kazuki	Need to acknowledge in the publications. Need to send a copy of the publication. http://smsd.eri.u-tokyo.ac.jp/smad/	Any time, as needed.
2017-D-13 Copies of old historical documents and interpretation	○SATAKE Kenji	No limitation Copies and interpretation of a part of special database of ERI library （http://wwweic.eri.u-tokyo.ac.jp/dl/meta_pub/G0000002erilib ）	Any time, as needed.
2017-D-14 Geoelectromagnetic Observation Database	○UYESHIMA Makoto, UTADA Hisashi	Must contact with the responsible person prior to the application. If you are benefitted with this service, please do not fail to acknowledge the ERI's Joint Usage in your presentations, reports or papers.	Any time, as needed.
2017-D-15 Provisional data at Yatsugatake geo-electromagnetic observatory	○OGAWA Tsutomu	Those who wish to use the observatory should contact the contact person at the ERI for arrangement and submit an application. Publications making use of the data should include an acknowledgement statement.	Any time, as needed.
2017-D-16 Heat flow dataset	○YAMANO Makoto	No limitation. Compilation of heat flow data in the northwest Pacific area, covering an area from 0 to 60°N and from 120 to 160°E, which includes the whole Philippine Sea, Japan Sea, and Sea of Okhotsk. It consists of station name, coordinates, altitude (or water depth), number of temperature measurements, maximum measurement depth, temperature gradient, number of thermal conductivity measurements, average thermal conductivity, heat flow, reference and year of publication. The heat flow values measured with submersibles or ROVs and those estimated from depths of gas hydrate BSRs (bottom simulating reflectors) are not included. The values less than or equal to zero are also excluded.	Any time, as needed.
2017-D-17 Aerial photographs of Japan	○ERI Library	This collection is for research purposes only: active fault research, seismology, volcanology, tectonics, etc. Please have a request at the service counter of ERI library. http://www.eri.u-tokyo.ac.jp/tosho/collection-e.html	Any time, as needed.

Joint Usage Code and Name of data/ records	Contact person (○Responsible person)	Conditions of Use and Related URL	Application periods
2017-D-18 Digital images of tsunami waveforms	○Head of Committee for old seismograms and mareograms	Apply through search system of digital images of tsunami waveforms. http://wwweic.eri.u-tokyo.ac.jp/tsunamidb/ Same condition to joint usage of ERI applies.	Any time, as needed.
2017-D-19 Special Project for Earthquake Disaster Mitigation in the Tokyo Metropolitan Area Date	○HIRATA Naoshi、SAKAI Shinichi	Must contact with the responsible person prior to the application. http://www.eri.u-tokyo.ac.jp/shuto/index.html (In Japanese only)	Any time, as needed.
2017-D-20 Superconducting Gravimeter Data	○IMANISHI Yuichi	Must contact with the responsible person prior to the application. Proper credit must be given when results from the data are published.	Any time, as needed.
2017-D-21 Special Project for Reducing Vulnerability for Urban Mega Earthquake Disasters Date	○HIRATA Naoshi、SAKAI Shinichi	Must contact with the responsible person prior to the application. http://www.eri.u-tokyo.ac.jp/project/toshi/ (In Japanese only)	Any time, as needed.