4. Coordination Research Project

1. Coordination Research Project

The coordination research project aims at a smooth accomplishment of a wide range of coordinated research activities in NIFS. It plans, establishes and supports the framework of coordinated research and opens coordinated research products for the effective use of them.

2. Coordination Research Committee

In order to accomplish the above-mentioned purpose, the coordination research committee with the sectional meetings as shown in Fig. 1 was set up and corresponds to a variety of coordinated researches.

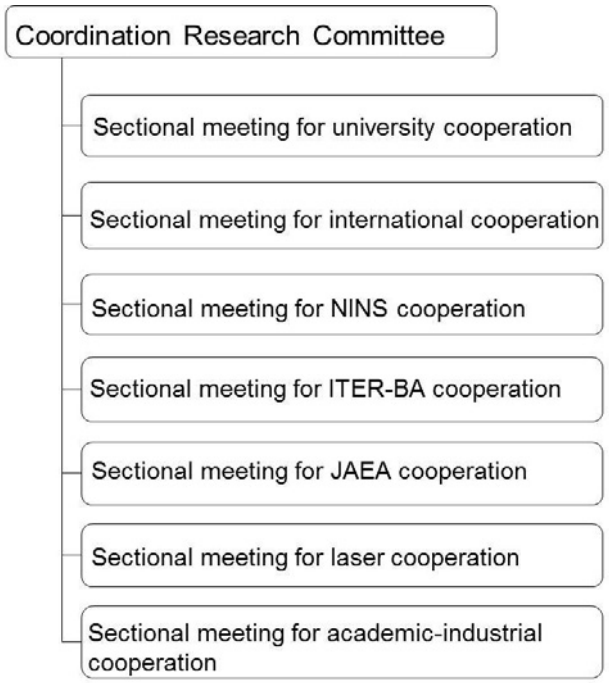

Fig. 1. Composition of coordination research committee.

"University cooperation" is the coordination based on the agreements between each domestic university and NIFS. NIFS started the coordinated researches based on the agreements with the universities, and the collaboration with 11 universities (Hokkaido University, University of Tsukuba, University of Toyama, Nagoya University, Osaka University, Gifu University, Tohoku University, Shizuoka University, Kyusyu University, Nagoya Institute of Technology, University of Hyogo) that makes the best use of the feature of both organizations has been executed in 2011.

"International cooperation" is categorized to the collaboration based on inter-governmental agreements such as the IEA stellarator-heliotorn agreement, the collaboration based on inter-institutional agreements with 16 institutes of 10 countries and the ITER International Organization. A very active international collaboration was executed in each field of the category.

"NINS cooperation" is the international collaboration research under the National Institutes of Natural Sciences (NINS) and the collaboration within NINS by five NINS member institutes (NAOJ, NIBB, NIPS, IMS and NIFS).

"ITER-BA cooperation" promotes international coordinated activities related to the ITPA (International Tokamak Physics Activity), the ITER project and the ITER-BA project.

"JAEA cooperation" promotes coordinated activities between the Japan Atomic Energy Research Institute (JAEA) and NIFS such as the support of joint experiments.

"Laser cooperation" promotes a nuclear fusion research application of the laser technique and a coordinated activity concerning the inertial confinement fusion research

"Academic-industrial coordination" is aimed to provide the latest technical findings of NIFS as payback to the society for an extensive use under collaboration with industry.

3. Achievements of Coordination Research

The achievements of coordinated research activities are included in each section in this annual report as a result of a wide range of joint research. Only a part in the result of coordinated research activities is settled here.

ITER/BA collaboration is one of the most important cooperation in NIFS, the activities of the sectorial meeting for ITER-BA cooperation including the contribution to the ITPA is summarized.

Relating to the laser cooperation, a new apparatus for fuel layering demonstration of FIREX (Fast Ignition Realization Experiment) target has been studied under the collaboration between ILE of Osaka University and NIFS. The hot electron measurement using electron spectrometer on FIREX was reported. The fundamental study of high energy laser system for plasma diagnosis and heating has been done as the collaboration with ILT (Institute for Laser Technology) and Osaka University. The basic research for cleaving of single crystal semiconductor materials by laser was reported as the collaboration with Chubu University.

The following 7 reports were performed in relation to the microwave application for the academic-industrial cooperation with Tohoku Univ., Electro-Communication Univ., Chubu Univ., Tokyo Univ. of the Arts, Sophia Univ., AIST and the Toki municipal institute of ceramics. The results of the fundamental studies for magnetic materials processing and environmental processing were reported. The results of the theoretical study of non-thermal microwave effect on intra-molecular reactions were reported. The planning and construction of a furnace heated by microwave with 120 kW at 2.45 GHz aiming at the effective and rapid production of pig iron were reported. As the study of the generation mechanism of microwave applied liquid plasma, the energy-saving liquid plasma generation device has been developed coupling microwaves and an ultrasonic homogenizer. As the elucidation of the microwave special effects in water, the difference of the heating behavior of the aqueous electrolyte solutions was reported under H-filed and E-filed. The evaluation of microwave absorption for solid and liquid samples was reported by coaxial cable probe method. The results of the practical trails of sintering ceramics by microwave kiln were reported as successful examples of the region cooperation.

Lastly, study of methods of scientific and industrial application of atomic and molecular data was summarized.

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