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 in 2010 and corresponds to a variety of coordinated researches.

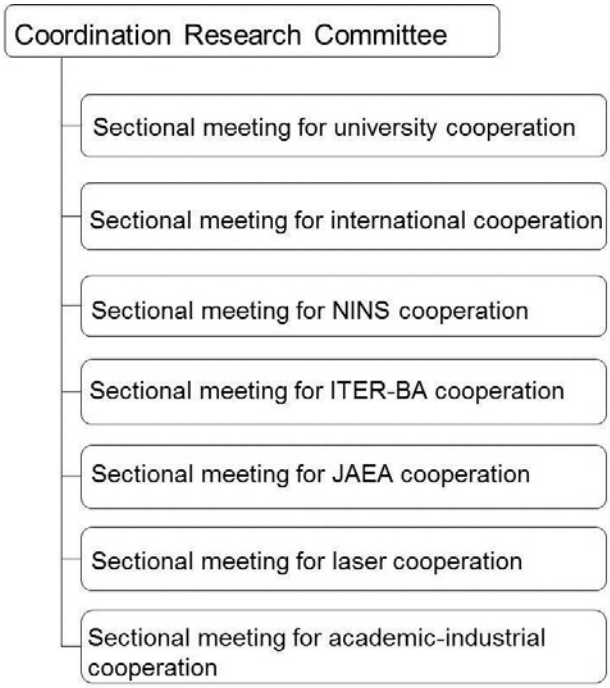

Fig. 1. Composition of coordination research committee.

"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 from 2005, and the collaboration with ten 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) that makes the best use of the feature of both organizations was executed in 2010.

"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 15 institutes of nine countries. 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) 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 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, the thermal stress analysis of a FIREX (Fast Ignition Realization Experiment) target was done when the plastic shell was filled with fuel and cooled down from 293 K to 10 K. The results of the electron spectrometer on FG02 experimental series of the FIREX-I Project were reported. The development of user friendly interface for simulation code was reported as the web interface to star code of ILT (Institute for Laser Technology). Remote sensing of density of carbon dioxide using LIDAR (Light Detection And Ranging) composed of the nitrogen laser was reported.

The following 7 reports were performed in relation to the microwave application that contemplated the academic-industrial cooperation. In order to study the mechanism of microwave effect in the nanoparticle synthesis, influence of microwave in surface plasmon of metallic nanoparticles was observed. The development of microwave transfer system from crystron generator to furnace for ironmaking was reported. Polyester synthesis by microwave assisted rapid polycondensation was reported. The microwave absorption for metal powders was evaluated by the coaxial cable probe method. The magnetic structure under the microwave heating was investigated using the neutron diffraction measurements. The temperature change and oxygen emission behavior of CuO during modulated-microwave irradiation were reported. In order to study the microwave heating of various states of water, the first-principle DFT molecular dynamics simulations of liquid water were reported.

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

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