

## §1. Collaborative Research Enhancement

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The collaborative research enhancing activities conducted by the Research Enhancement Strategy Office (RESO) in FY2015 are reported. The activities consist of following topics:

1. Sending researchers to foreign institutes to enhance the stellarator-heliotron (S-H) research, and steady state operation (SSO) research, respectively.
2. Sending researchers to foreign institutes to enhance the interdisciplinary collaborative research.
3. Inviting leading researchers in the foreign institutes to enhance the plasma physics research in the LHD.
4. Inviting researchers from Asian institutes to enhance the collaborative researches between NIFS and the Asian institutes
5. Coordination of collaborative researches in the field of Plasma-Bio applications to enhance the collaboration with domestic universities.
6. Conclusion of new bilateral scientific agreement between NIFS and HiLASE in Czech to enhance the collaborative research in the field of laser technique.

In the W7-X, a world largest superconducting helias-type device in the Max Planck Institute of Plasma Physics (IPP) in Greifswald in Germany, its first plasma was ignited on 10 December 2015 successfully, and the 1<sup>st</sup> experiment campaign, OP1.1, was lasted until 10 March 2016. The RESO sent four researchers to the IPP for more than 2 months. They joined W7-X team to build up networks of communications, and to experience the start-up of a large-scale fusion device. A RESO member attended the Coordinated Working Group Meeting (CWGM), in which the S-H collaborative research is discussed. The RESO also sent a researcher to the Institute for Magnetic Fusion Research (IRFM) in France, for attending the program workshop of the WEST, the superconducting tokamaks for SSO study. The experiment in the WEST will be started in autumn 2016.

The RESO reinforced the ties between NIFS and Princeton University in cooperation with the NINS CRA and URA posted in Princeton University, for NIFS and Japanese Universities researchers joining to the “Max-Planck Princeton Research Center for Plasma Physics,” in which the interdisciplinary researches between cosmic plasma and fusion plasma are conducted. The RESO sent

researchers in NIFS, Univ. Tokyo and Nagoya Univ. to the meeting of the center held in Berlin. A new memorandum of understanding are prepared for that.

The RESO held the “International Workshop on the Deuterium experiment in LHD” on 9 - 10 February 2016, at NIFS, and invited leading researchers from EU, U.S.A, Korea and China. The purpose of the workshop was to discuss the isotope effects on plasma confinement in fusion devices, and the experimental plan of the LHD deuterium experiment, which is one of the main activities of the third-stage middle term plan from FY2016 in NIFS.

The RESO invited researchers from the universities and institutes in Thailand to construct the research network in Asia. The NIFS researchers discussed with them to explore the seeds of collaborative researches, and found some. Two bilateral scientific agreements will be concluded between NIFS and Chiang University and Thailand Institute of Nuclear Technology, respectively.

The RESO coordinated the collaborative research in the field of Plasma-Bio applications between NIFS and Nagoya University. Plasma-Bio applications has been intensely conducted in the world, recently. NIFS can provide plasma diagnostics techniques to measure plasma parameters in the non-equilibrium atmospheric plasma, which mainly used in the research. The RESO sent a researcher to the international conference of Plasma-Bio application to explore the research situation of Plasma-Bio applications.

The RESO coordinated the conclusion of the new bilateral scientific agreement between NIFS and HiLASE, which is the center of laser technology research in Czech to enhance the collaborative research. Some researchers and students came to NIFS to join the Thomson scattering measurement group in LHD.