COMMENTS

In this issue of *Fusion Science and Technology* (*FS&T*), we are pleased to bring you the contributions from the Large Helical Device (LHD) project, located at the National Institute for Fusion Science (NIFS), in Toki-city, Gifu, Japan. During the past decade, *FS&T* has been working with international experimental groups to contribute to series of special issues to recognize and highlight the science and technology contributions of these experiments to successful development of fusion energy. This series will have a long-lasting value to the fusion community, from desktops to classrooms, to help attract and educate a new generation of scientists and engineers who will be the ones to build, run, and scientifically exploit the benefits of all that has been achieved in the international fusion program.

We are deeply indebted to the LHD Team and to the contributing authors for their efforts in preparing this special issue for the readers of *FS&T*. The 13 chapters with 60 papers included in this issue survived the rigors of the peer review process, courtesy of 135 international reviewers. This LHD special issue marks the 20th anniversary of the NIFS, founded on May 29, 1989, to conduct the heliotron research that includes the LHD project. The papers in this issue cover the period of the past 12 years of LHD operation from its first plasma on March 31, 1998, to early 2010. They are either original contributions or informative reviews of the LHD physics results and technological developments. Certainly, this issue could not have been possible without the support and encouragement from the NIFS/LHD leadership: Professor Emeritus Osamu Motojima and Prof. Akio Komori, past and present Director General, respectively. Our special thanks are due Prof. Hiroshi Yamada and Prof. Satoru Sakakibara for their help with the coordination of the issue and for serving as the guest editors.

The LHD is the largest operating superconducting helical device in the world, employing a heliotron magnetic field originally developed in Japan. The objective of the project is to conduct fusion plasma confinement research in a steady state in order to explore possible solutions to physics and engineering problems in helical plasma reactors. The LHD uses neutral beam injection, ion cyclotron radio frequency (ICRF), and electron cyclotron resonance heating (ECRH) to heat the plasma, much like any other fusion confinement concepts.

Starting with the LHD's successful production of the first plasma in 1998, outstanding plasma parameters have been achieved, such as the record plasma stored energy of 1 MJ, electron and ion temperatures of 10 keV, and innovative approaches to net current-free plasmas. These results show that the LHD has reactor-relevant plasma confinement properties comparable to those of the world's largest tokomaks. During its 12 years of operation, the LHD has been carrying out a number of innovative research techniques and technologies (most of which are covered in this issue) that are important for the development of fusion energy. Through the NIFS interuniversity research organization, the LHD also provides hands-on experience for students and faculty to conduct research and learn how to operate and carry out experiments in a world-class fusion facility.

The breadth and depth of the LHD research program and its contributions to fusion research are clearly evident in the papers contained in this issue. We wish all authors continued success and look forward to their future contributions.

On the occasion of the 20th anniversary of the NIFS, this special issue is dedicated to the outstanding team of scientists, engineers, and support staff that has contributed to the success of the LHD project.

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