

Status and prospect of international collaboration on PWI research : Introduction

国際共同研究による P W I 研究の進展と今後の展開：趣旨説明

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In this symposium, status and prospect of international collaboration on PWI are overviewed and discussed. Several speakers will give short talks on their collaboration research results with emphasis on the importance of international collaboration. In discussion time, we would like to hear various opinions from participants of this symposium.

1. Purpose of this symposium

In order to understand basic phenomena and establish necessary control methods for PWI (Plasma Wall Interaction) in ITER and DEMO reactors, studies on edge plasma physics and plasma materials interaction in relevant experimental devices and methods are necessary. We need special devices designed exclusively for these purposes. For example, since ITER and DEMO reactors will use toxic and radioactive materials such as beryllium and tritium, special experimental devices to allow the use of these materials are necessary. Innovative concepts such as DED (Dynamic Ergodic Divertor) have to be pursued to investigate its applicability to fusion reactors. Performing some of dedicated experiments for these purposes are difficult or impossible in Japan. In addition, information exchange and intensive discussion with leading researchers in the world are indispensable for effective fusion reactor development in Japan. Especially in the field of PWI, many types of researchers with different backgrounds (plasma physics, material engineering, etc.) need to cooperate together to understand phenomena in complicated fusion reactor environment.

For these purposes, there have been several international collaborations between Japan and EU, Japan and USA, and so on. In this symposium, achievements from TEXTOR collaboration and the other J-EU and J-US collaboration will be briefly presented with an emphasis of the importance of these works in fusion reactor development. Especially, TEXTOR collaboration is one of the most successful international collaboration with participation of many university researchers for about 30 years. But the IEA agreement on this collaboration will be expired in 2013. Since the value of international collaboration becomes increasingly important, we need to establish even more effective collaboration framework in near future.

Based on these achievements and future prospect of the ITER project and fusion reactor developments,

discussions will be made on how to proceed future internal collaboration in PWI research. International collaboration also significantly contributes young researchers to increase valuable experiences and to get to know foreign researchers. In this symposium, this aspect will be also stressed.

2. List of presentations

After this introduction, the following talks will be given to give ideas on how international collaboration in the field of PWI have been performed and on the prospect of future collaboration. Finally, we will have discussion time mainly to hear questions and suggestions from audience. I hope to make this symposium fruitful for all participants.

“Reminiscence of PWI studies performed under international co-operations and suggestions for future works” T. Tanabe (Kyushu University)

“Application of resonant magnetic perturbations to tokamak plasmas”, Y. Kikuchi (University of Hyogo)

“Plasma Behavior Analysis through PWI Phenomena in the Dynamic Ergodic Divertor Plasma”, M. Sakamoto (Tsukuba University)

“Tritium accumulation in plasma facing walls”, Y. Torikai (University of Toyama)

“Behavior of hydrogen isotopes in neutron-irradiated plasma-facing materials”, Y. Hatano (University of Toyama)

“Future prospects of international collaboration on PWI research”, Y. Nakamura (NIFS)