

§6. Archival Study on Development of Heliotron Devices

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This archival study is focused on the fusion oriented high temperature plasma experimental devices developed and constructed in universities, especially on the series of Heliotron devices, which have been originally proposed and developed in Kyoto University by the late professor emeritus of Kyoto University Koji UO [1].


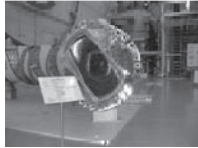
After the proof-of-principle experiment in Heliotron E (Kyoto University), the Helical-Heliotron concept is now in its parameter expansion phase and a lot of remarkable results have been obtained through the LHD project in National Institute for Fusion Science (NIFS). On the other hand, in Kyoto University, a new generation of the heliotron concept, Helical-Axis Heliotron [2], was proposed by Kyoto group and of which basic idea has been experimentally examined through the Heliotron J project in Laboratory for Complex Energy Processes, Institute of Advanced Energy (IAE), Kyoto University under the auspices of the NIFS Collaborative Research Program.

This archival study aims at the comprehensive and systematic arrangement of the existing materials for a series of Heliotron devices in Kyoto University, and carrying out collection, arrangement and analysis of the relating material from the technological viewpoint in device design, construction and operation control. As one of the goals of this archival study, we are planning to build up an electronic database of these materials.

The current situations of Heliotron devices (the torus and/or coils) were re-checked through this activity in 2007 as shown in Table 1. The preservation states of the documents, drawings and photographs for Heliotron DM, E, DR and J were also checked including those for the relating utilities, heating equipments, diagnostics and buildings. A part of the materials relating to the Heliotron D device is stored as the Uo's collection under control of Future Energy Research Association (<http://www8.plala.or.jp/mirai/>).

We have started to collect electronic files of these materials (including resent ones) since FY2008. The photographs in Table 1 show Heliotron D and Heliotron E displayed at NIFS. These electronic files will be referred to through a database system in near future.

Table 1. Current situations of Heliotron devices

Device Name	Preservation	remarks
Heliotron A	NOT existent	
Heliotron B	preserved as an exhibit in IAE, Kyoto Univ.	full torus
Heliotron C	preserved as an exhibit in IAE, Kyoto Univ.	parts of the device
Heliotron D	preserved as an exhibit in NIFS 	full torus. one set of HFC is in IAE Kyoto Univ.
Heliotron DM	preserved as an exhibit in IAE, Kyoto Univ.	a full torus
Heliotron E	preserved as an exhibit in NIFS 	a part of the torus and the helical coils. TFCs and PFCa are in IAE Kyoto Univ. a segment model of the vacuum chamber is in IAE Kyoto Univ.
Heliotron DR	under experiment in Kanazawa Univ.	
Heliotron J	under experiment in IAE Kyoto Univ.	

- [1] K. Uo, at Kakuyugo-Kondankai (May, 1958)
 [2] M. Wakatani, et al., 17th IAEA Fusion Energy Conf. (Yokohama, 1998) IAEA-CN-69/EX2/5.

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