

§5. Archival Studies on Development of Heliotron Devices

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This archival study is focused on the fusion plasma-relating apparatus developed and constructed in universities, especially on the series of Heliotron devices, which have been originally proposed and developed in Kyoto University. After the proof-of-principle experiment in Heliotron E (Kyoto University), the Helical-Heliotron concept is now in the parameter expansion phase and a lot of remarkable results have been obtained through the LHD project in National Institute for Fusion Science (NIFS). A new generation of the heliotron concept, a Helical-Axis Heliotron, was proposed by Kyoto group and has been experimentally examined through the Heliotron J project in 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 material 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. The major activities in FY2007 are as follows.



Fig. 1. An example of the collection of drawings for the Heliotron E device

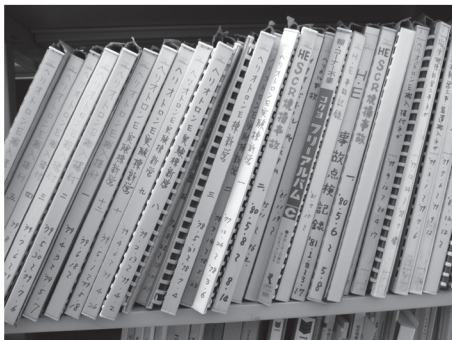


Fig. 2 Some photograph albums for the Heliotron E device

- i) Discussions on the basic format for hardware archives
 Recently, the similar archival studies focused on the fusion plasma devices have been started in other institutes/organizations. From the viewpoint of Fusion Science Archives in Japan, the basic format of records should be unified among these activities. However, a standard format for the hardware archive is not established yet. We started discussions on this point with other archival groups in general meetings at NIFS.
- ii) List-up of the current situations of Heliotron devices
 The current situations of Heliotron devices (the torus and/or coils) were re-checked. A brief summary is listed in Table 1.
- iii) Documents and Drawings for Heliotron Devices
 The storage conditions of the documents, drawings and photographs for Heliotron DM, E, DR and J were checked including those for the relating utilities, heating equipments, diagnostics and buildings. Figs. 1 and 2 are examples of such materials. The current situation of the collections of the experimental logs was also checked.

Table 1. Current situations of Heliotron devices

Device Name	Storage Condition	remarks
Heliotron A	NOT existent	
Heliotron B	stored as an exhibit in IAE, Kyoto Univ.	full torus
Heliotron C	stored in IAE Kyoto Univ.	A part
Heliotron D	stored in NIFS	full torus. One set of HFC is stored in IAE Kyoto Univ.
Heliotron DM	stored as an exhibit in IAE, Kyoto Univ.	a full torus
Heliotron E	stored 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.	