

Accelerator Division - General -

Noritaka KUMAGAI

SPRING-8 (Super Photon ring - 8 GeV) is the facility of "a third generation" synchrotron radiation source in the X-ray region. The facility consists of an accelerator complex (1 GeV linac, 8 GeV synchrotron and 8 GeV storage ring) and 61 photon beam lines. The beam commissioning is being scheduled in 1996. During FY 1995, the construction of the accelerator complex was made progress on schedule.

1. 1 GeV linac

The linac components, such as a preinjector, 26 accelerator columns, 13 rf power sources (80MW klystron and 190MW modulator), focusing magnets, were almost fabricated and installed in linac building. By using a laser system with the position resolution of $\pm 15 \mu\text{m}$, focusing magnets and accelerator columns were aligned within 0.1mm along straight line through the total length of 140m.

2. Synchrotron

All components of the synchrotron were fabricated successfully and installed in site. The magnetic properties of main magnet were proved by field measurement, and the main magnets, (64 dipoles, 80 quadrupole and 60 sextupole magnets) were aligned within the position accuracy of 0.2mm by laser tracking system. Eight 5-cell cavities were tested and their rf performance were proved. Also the construction of rf power station was continued on schedule.

3. Storage ring

The fabrication of main magnets were finished and their magnetic qualities were proved by field measurement. The main magnets were aligned with the high position accuracy in storage ring by using laser alignment system and a laser tracking system. Also, the power supplies of the main magnets were installed in the power station and the development of their control program started. Other magnets system, such as injection

septum, bump magnets and steering magnets, were being fabricated on schedule.

An rf test stand was transferred from Wako site of RIKEN to T station in Harima site. In this test stand, high power test were carried out for 1MW circulators, input coupler, 5-cell cavities and so on. The fabrication of 8 single-cell cavities of storage ring were completed and their high power test were finished successfully.

The installation of vacuum system in storage ring were almost finished and their baking test at 150°C were carried out for a half of the vacuum system. The residual pressure after the baking test was realized in the order of 10^{-8}Pa or less.

The electrical center of beam position monitor installed in vacuum chamber were calibrated within the accuracy of $50 \mu\text{m}$ by using rf-antenna. The basic design of control software for accelerator were finished, and the VME systems of magnets and rf systems were partially installed in storage ring control system and were tested. Also the fabrication and installation of the control hardware were made progress on schedule.