

## STATUS OF THE CONSTRUCTION OF A SMALL SUPERCONDUCTING CYCLOTRON

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### Abstract

Present status of the construction of a small (pole diameter 32 cm) superconducting cyclotron is reported.

The Kyoto University cyclotron group has now a project of constructing a small superconducting cyclotron. The main purpose of this project is to study in detail the feasibility of a small superconducting AVF cyclotron and also to serve basic data for the construction of large-scale ones.

The present phase of the construction is centered around superconducting magnet system. In Fig. 1 is shown the elevation view of the magnet and in Table 1 is given basic parameters of the system. In order to adjust magnetic field more easily, coils above and below the median plane were divided into two sections and each section can be excited independently. Voltages applied to the coils are measured to detect quenching of the coils. The coil bobbin is held in position by a set of nine epoxy and fiber-glass support links, and the position of the coil is measured by detecting tensile-stresses acting on the support links with strain gauges.

The cryostat system has been completed and tested with overall success. The maximum conducting current was 700 A, near to the critical current of the coil.

The iron yoke will be installed till the end of this year. Model study of a RF system is now in progress<sup>1)</sup> and a measurement system of high magnetic field with flip-coils has been constructed and now in running test.

1) K. Mashiko et al., contribution to this symposium.

Table 1. Main parameters of the superconducting coil and cryostat system.

Inner coil diameter	-----	400 mm
Outer coil diameter	-----	470 mm
Coil height	-----	34 mm
Coil splitting	-----	2 section
Lower coil distance from median plane	-----	40 mm
Gap between two coil section	-----	6 mm
Maximum current density	-----	24700 A/cm <sup>2</sup>
Ampereturns at maximum current	-----	1×10 <sup>6</sup> AT
Conductor	-----	Nb-Ti
Cryostat inner diameter	-----	326 mm
Cryostat outer diameter	-----	800 mm
Cryostat height	-----	800 mm
Yoke height	-----	1140 mm
Yoke inner diameter	-----	980 mm
Yoke outer diameter	-----	1100 mm

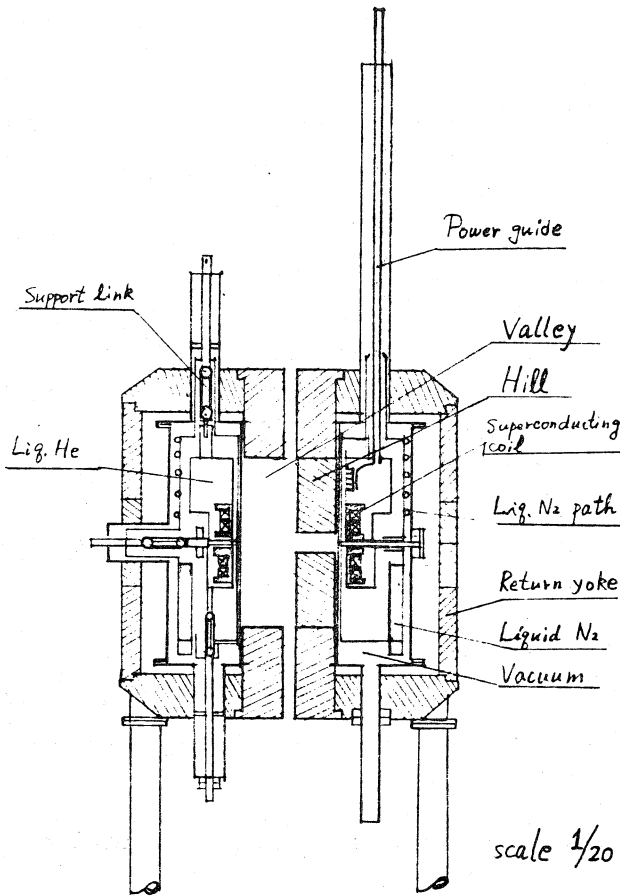


Fig. 1. Elevation view of the 32 cm cyclotron magnet.