

ENTRY NO. **C8** Date **Sep. 20, 1995**
 Name of Machine **HIRFL Sector Focusing Cyclotron (Injector)**
 Institution **Institute of Modern Physics, Chinese Academy of Sciences (IMP)**
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 In Charge: **B. W. Wei** Reported by: **F. Ye**

HISTORY
MILESTONE DATES:
 Design Model Tests
 Construction First Beam
DESIGN/CONSTRUCTION BY:
 in house other
COST: Accelerator Facility
FUNDED BY:

STATUS
STAFF: Machine
 Scientists 10 Engineers 10
 Technicians 10 Students 3
 Research (in house/external)
 Scientists / Engineers /
 Technicians / Students /
BUDGET: Machine Funded by
 Research Funded by
TIME DISTRIBUTION:
 Basic Research (in house/external) % / %
 Applied Program (in house/external) % / %
 Maintenance % Development %

MAGNET
POLE PARAMETERS:
 Diameter 170 cm $R_{extract}$ 75 cm R_{inject} 4.5 cm
HILL PARAMETERS: Gap (min) 19 cm B_{max} 2.0 T
 (@ AT) Gap (max) cm B_{min} T
VALLEY PARAMETERS: Gap (min) 31.6 cm B_{max} 1.2 T
 (@ AT) Gap (max) cm B_{min} T
AVERAGE FIELD: $\langle B \rangle_{min}$ 0.8 T $\langle B \rangle_{max}$ 1.6 T
NUMBER OF SECTORS: compact/separated 3 / 1
 sector angle deg. spiral (max) 33 deg.
FIELD TRIMMING: Trim Coils 12
 Harmonic Coils 4 X 3
 Other
CURRENT: Main Coils 1300 Amps Stability $1 \cdot 10^{-5}$
 Trim Coils 500 Amps Stability $1 \cdot 10^{-4}$
 Stored Energy (cryogenic) MJ
WEIGHT: Iron 220 tons Conductor 16 tons
ION ENERGY: Bending Limit E/A = 69 q²/A² MeV/u
 Focusing Limit E/A = q/A MeV/u

ACCELERATION SYSTEM
FUNDAMENTAL ACCELERATION:
 Description: $\lambda/2$ resonator
 No. of Gaps/turn 2 $dE/dn(max)$ 0.2 MeV/q
 Voltage (max) 100 MV Harmonic f_r/f_{ion} 1.3
 Freq. 6.18 MHz Power in(max) 0.2 MW
 Stability: Phase Voltage 10^{-3}
OTHER CAVITIES (Flattopping or otherwise):
 Description:
 Region of Influence: R_{min} cm R_{max} cm
 No. of Gaps/turn $dE/dn(max)$ MeV/q
 Voltage (max) MV Harmonic f_r/f_{ion}
 Freq. MHz Power in(max) MW
 Stability: Phase Voltage

VACUUM SYSTEM
OPERATING PRESSURE: $5 \cdot 10^{-5}$ Pa
PUMPS: (No. and type)
 2 turbo-pumps, rough pumping system

ION SOURCE(S)
 Type Intensity @ $\epsilon_n = \beta\gamma\epsilon$ Ion Species
 (mA) (π mm mrad)
 (a) ECR 0.02 - 0.3 200 c - Ta
 (b)
 (c)
 (d)

INJECTION SYSTEM
 spiral electrostatic Efficiency 30 %
 inflector
EXTRACTION SYSTEM
 electrostatic deflectors Efficiency 70 %
 + magnetic channel

CHARACTERISTIC BEAMS
 Current (part μ A)
 Accelerated Ions E/A (MeV/u) Internal External
 (a) C^{14+} 4.5 5
 (b) O^{6+} 4.5 4
 (c) Ar^{8+} 2.4 2
 (d) Xe^{14+} 0.77 0.1
 Secondary Particles E (MeV) part/sec
 (a)
 (b)
 (c)

EXTRACTED BEAM PROPERTIES:
 For μ A of MeV/u ions
 $\Delta E/E$ % $\Delta\phi$ °rf
 $\epsilon_n = \beta\gamma\epsilon$ x π mm mrad z π mm mrad

FACILITIES FOR RESEARCH
 SHIELDED AREA: Fixed: m² Moveable m²
 Target Stations: No. Served At Same Time:
MAGNETIC SPECTROMETERS:
OTHER FACILITIES:

REFERENCES/NOTES
 (a)
 (b)

