

ENTRY NO. C46 Date November 1995
 Name of Machine U-400M
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HISTORY

MILESTONE DATES:

Design 1985-1987 Model Tests
 Construction 1987-1990 First Beam 1991

DESIGN/CONSTRUCTION BY:

in house other

COST: Accelerator Facility

FUNDED BY:

STATUS

STAFF: Machine

Scientists 3 Engineers 5
 Technicians 10 Students 2

Research (in house/external)

Scientists / Engineers /

Technicians / Students /

BUDGET: Machine Funded by

Research Funded by

TIME DISTRIBUTION:

Basic Research (in house/external) 45 % / 30 %

Applied Program (in house/external) % / %

Maintenance 5 % Development 20 %

MAGNET

POLE PARAMETERS:

Diameter 400 cm R_{extract} 175 cm R_{inject} cm

HILL PARAMETERS: Gap (min) 10 cm B_{max} 2.55 T

(@ AT) Gap (max) cm B_{min} T

VALLEY PARAMETERS: Gap (min) cm B_{max} T

(@ AT) Gap (max) 50 cm B_{min} 1.4 T

AVERAGE FIELD: $\langle B \rangle_{\text{min}}$ 1.5 T $\langle B \rangle_{\text{max}}$ 1.93 T

NUMBER OF SECTORS: compact/separated 4 /

sector angle 45 deg. spiral (max) 40 deg.

FIELD TRIMMING: Trim Coils 15

Harmonic Coils 5

Other

CURRENT: Main Coils 2200 Amps Stability 10^{-4}

Trim Coils 30 Amps Stability 10^{-3}

Stored Energy (cryogenic) MJ

WEIGHT: Iron 2100 Conductor 115

ION ENERGY: Bending Limit E/A = 400-540 q^2/A^2 MeV/u

Focusing Limit E/A = 200 q/A MeV/u

ACCELERATION SYSTEM

FUNDAMENTAL ACCELERATION:

Description: 4 Dees system, MS

No. of Gaps/turn 8 dE/dn(max) 0.8 MeV/q

Voltage (max) 0.15-0.2 MV Harmonic f_r/f_{ion} 2, 3, 4

Freq 11.5-24.5 MHz Power in(max) 0.4 MW

Stability: Phase Voltage 10^{-3}

OTHER CAVITIES (Flatopping 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: (0.5-1) 10^{-6} mbar

PUMPS: (No. and type) 20,000 l/s for N_2

ION SOURCE(S)

Type	Intensity (mA)	@ $\epsilon_n = \beta\gamma\epsilon$ (π mm mrad)	Ion Species
(a) ECR-4M(14.5Chz)			
(b)			
(c)			
(d)			

INJECTION SYSTEM

Axial injection, elect.mirror (1995) Efficiency %
 spiral inflector (1996)

EXTRACTION SYSTEM

Stripping, magnetic deflectors Efficiency %

CHARACTERISTIC BEAMS

Accelerated Ions	E/A (MeV/u)	Current (part μ A)	Internal	External
(a) $^6\text{Li}^{2+}$	50	1.5	0.7	
(b) $^{14}\text{N}^{5+}$	60	0.15	0.13	
(c)				
(d)				

Secondary Particles	E (MeV)	part/sec
(a) ^6He	300	10^5
(b)		
(c)		

EXTRACTED BEAM PROPERTIES:

For μ A of MeV/u ions
 $\Delta E/E$ $2 \cdot 10^{-3}$ % $\Delta\phi$ 20 °rf
 $\epsilon_n = \beta\gamma\epsilon$ $\times 6$ π mm mrad z 6 π mm mrad

FACILITIES FOR RESEARCH

SHIELDED AREA: Fixed: 1800 m² Moveable m²

Target Stations: 6 No. Served At Same Time: 1

MAGNETIC SPECTROMETERS:

OTHER FACILITIES: 4 π -detector array of charged particles and nuclei F0B0S, high resolution fragment separator COMBAS.

REFERENCES/NOTES

(a) Proc. 13th Int. Conf. on Cyclotrons, p.11
 (b)

PLAN VIEW OF FACILITY, COMMENTS