

ENTRY NO. C49 Date June 25/92
Name of Machine Gatchina cyclotron
Institution PNPI Russian Academy of Sciences
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Tel Telex Fax EMAIL
In Charge: N.K. Abrosimov Reported by:

HISTORY

MILESTONE DATES:

Design 1990 - 1992 Model Tests 1991 - 1992
Construction 1992 - 1994 First Beam

DESIGN/CONSTRUCTION BY:

in house YES other Various engineering contractors

COST: Accelerator Facility

FUNDED BY:

STATUS

STAFF: Machine

Scientists Engineers
Technicians Students
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) % / %
Development % Maintenance %

MAGNET

POLE PARAMETERS:

Diameter 205 cm R_{extract} 85-90 cm R_{inject} cm
HILL PARAMETERS: Gap (min) 146 cm B_{max} T

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

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

(0 AT) Gap (max) 386 cm B_{min} T

AVERAGE FIELD: $\langle B \rangle_{\text{min}}$ 1.352 T $\langle B \rangle_{\text{max}}$ 1.46 T

NUMBER OF SECTORS: compact/separated 4 /

sector angle 42.5 deg. spiral (max) 60 deg.

FIELD TRIMMING: Trim Coils

Harmonic Coils 4x4

Other

CURRENT: Main Coils 800 Amps Stability

Trim Coils Amps Stability

Stored Energy (cryogenic) MJ

WEIGHT: Iron 220 Conductor 16 (Cu)

ION ENERGY: Bending Limit $E/A = 80 \text{ q}^2/A^2 \text{ MeV/u}$

Focussing Limit $E/A = \text{q/A MeV/u}$

ACCELERATION SYSTEM

FUNDAMENTAL ACCELERATION:

Description: 2, $\lambda/4$

No. of Gaps/turn 4 $dE/dn(\text{max})$ 0.200 MeV/q

Voltage(max) 0.060 MV Harmonic $f_{\text{rf}}/f_{\text{ion}}$ 2/1

Freq 41.2 MHz Power in(max) 2x0.040 MW

Stability: Phase Voltage

OTHER CAVITIES (Flattopping or otherwise):

Description:

Region of Influence: R_{min} cm R_{max} cm

No. of Gaps/turn $dE/dn(\text{max})$ MeV/q

Voltage(max) MV Harmonic $f_{\text{rf}}/f_{\text{ion}}$

Freq MHz Power in(max) MW

Stability: Phase Voltage

VACUUM SYSTEM

OPERATING PRESSURE: 10^{-7} (N_2), 10^{-6} (H_2)

PUMPS: No. and type 2 turbo $10 \text{ m}^3/\text{s}$

2 evapor, getter $60 \text{ m}^3/\text{s}$ (H_2), Cryopanel (N_2) - 0.3 m^2

ION SOURCE(S)

Type	Intensity (mA)	$\epsilon_n = \beta\gamma\epsilon$ (mm mrad)	Ion Species
(a)		internal	Ehlers Pig..
(b)		external	Surface P..
(c)			Cusp
(d)			

INJECTION SYSTEM

axial injection Efficiency %

EXTRACTION SYSTEM

stripping Efficiency 100 %

CHARACTERISTIC BEAMS

Accelerated Ions	E/A (MeV/u)	Current (part μA)	Internal	External
(a) H^+	45 - 80	100	p 100	
(b)				
(c)				
(d)				

Secondary Particles	E (MeV)	part/sec
(a)		
(b)		
(c)		

EXTRACTED BEAM PROPERTIES:

For μA of MeV/u ions
 $\Delta E/E$ % $\Delta\phi$ °rf
 $\epsilon_n = \beta\gamma\epsilon$ x $\pi\text{mm mrad}$ z $\pi\text{mm mrad}$

FACILITIES FOR RESEARCH

SHIELDED AREA: Fixed m^2 Moveable m^2

Target Stations: No. Served At Same Time:

MAGNETIC SPECTROMETERS:

OTHER FACILITIES:

REFERENCES/NOTES

(a) XIII International Cyclotron Conference,
(b) Vancouver 92

PLAN VIEW OF FACILITY, COMMENTS