ENTRY NO. C73 Date 02-OCT-95

Name of Machine 60-inch cyclotron

Institution Brookhaven National Laboratory

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In Charge: J. S. Fowler Reported by: D. J. Schlyer

HISTORY

MILESTONE DATES:

Design 1963 Model Tests 1963

Construction 1964 First Beam 1968

DESIGN/CONSTRUCTION BY:

in house xx other

COST: Accelerator 400,000 Facility 950,000

FUNDED BY: USAEC-DOE

STATUS

STAFF: Machine

Scientists 1 Engineers

Technicians 1 Students

Research (in house/external)

Scientists 2 / 0 Engineers /

Technicians / Students /

BUDGET: Machine Funded by DOE-NIH

Research Funded by DOE-NIH

TIME DISTRIBUTION:

Basic Research (in house/external) 95 % / 5 %

Applied Program (in house/external) % / %

Maintenance % Development 5 %

MAGNET

POLE PARAMETERS:

Diameter 152 cm $R_{extract}$ 65 cm R_{inject} 0 cm

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

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

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

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

AVERAGE FIELD: $<B>_{min}$ 1 T $<B>_{max}$ 1.54 T

NUMBER OF SECTORS: compact/separated 3 /

sector angle deg. spiral (max) 50 deg.

FIELD TRIMMING: Trim Coils 8

Harmonic Coils 5

Other

CURRENT: Main Coils 1200 Amps Stability

Trim Coils 300 Amps Stability

Stored Energy (cryogenic) MJ

WEIGHT: Iron 196 Tons Conductor Cu hollow

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

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

ACCELERATION SYSTEM

FUNDAMENTAL ACCELERATION:

Description: 1 DEE, 1 DUMMY DEE @ 180°

No. of Gaps/turn 2 dE/dn(max) 0.120 MeV/q

Voltage (max) 0.060 MV Harmonic f_{rf}/f_{ion} 1,3

Freq MHz Power in(max) 0.100 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(max) MeV/q

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

Freq MHz Power in(max) MW

Stability: Phase Voltage

VACUUM SYSTEM

OPERATING PRESSURE: 1×10^{-5} Torr

PUMPS: (No. and type) 1 - Diffusion 24"

ION SOURCE(S)

	Type	Intensity (mA)	@ $\varepsilon_n = \beta\gamma\varepsilon$ (π mm mrad)	Ion Species
(a)	hot filament			H^+
(b)				
(c)				
(d)				

INJECTION SYSTEM

Efficiency %

EXTRACTION SYSTEM

Electrostatic Efficiency 10 %

CHARACTERISTIC BEAMS

	Accelerated Ions	E/A (MeV/u)	Current (part μA) Internal	External
(a)	H^+	34	300	25
(b)	D^+	23	300	20
(c)	$He\text{-}3^{++}$	56	200	10
(d)	$He\text{-}4^{++}$	46	200	10

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

EXTRACTED BEAM PROPERTIES:

For μA of MeV/u ions

$\Delta E/E$ % $\Delta\phi$ °rf

$\varepsilon_n = \beta\gamma\varepsilon$ x π mm mrad z π mm mrad

FACILITIES FOR RESEARCH

SHIELDED AREA: Fixed: 100 m^2 Moveable m^2

Target Stations: 2 No. Served At Same Time: 1

MAGNETIC SPECTROMETERS:

OTHER FACILITIES:

REFERENCES/NOTES

(a)

(b)

PLAN VIEW OF FACILITY, COMMENTS