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Name of Machine Chandigarh Variable Energy Cyclotron

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HISTORY

MILESTONE DATES:

Design 1953 Model Tests *

Construction 1965-70 First Beam 1971

DESIGN/CONSTRUCTION BY:

in house other

COST: Accelerator $. 250,000 Facility 400,000

FUNDED BY: UGC, New Delhi-India and P.U, Chandigarh.

STATUS

STAFF: Machine

Scientists 4 Engineers 4

Technicians 5 Students 4

Research (in house/external)

Scientists 5 / Engineers /

Technicians / Students 2 /

BUDGET: Machine Funded by

Research Funded by

TIME DISTRIBUTION:

Basic Research (in house/external) 75 % / 25 %

Applied Program (in house/external) % / %

Development % Maintenance %

MAGNET

POLE PARAMETERS:

Diameter 66 cm $R_{extract}$ 28 cm R_{inject} 0 cm

HILL PARAMETERS: Gap (min) 16 cm B_{max} 16 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: $< B >_{min}$ T $< B >_{max}$ T

NUMBER OF SECTORS: compact/separated /

sector angle deg. spiral (max) deg.

FIELD TRIMMING: Trim Coils

Harmonic Coils

Other

CURRENT: Main Coils 400 Amps Stability

Trim Coils Amps Stability

Stored Energy (cryogenic) MJ

WEIGHT: Iron 20 tons Conductor

ION ENERGY: Bending Limit E/A = 8 q^2/A^2 MeV/u

Focussing Limit E/A = 8 q/A MeV/u

ACCELERATION SYSTEM

FUNDAMENTAL ACCELERATION:

Description:

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

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: 2.10^{-5} mm of Hg Torr or mbar

PUMPS: No. and type 4 Diffusion Pumps (15,3 cm)

1 Diff.Pump 23 cm, 2 Kinney Rotary Pumps

ION SOURCE(S)

	Type	Intensity (mA)	@	$\epsilon_n = \beta\gamma\epsilon$ (πmm mrad)	Ion Species
(a)	Hooded Arc				
(b)					
(c)					
(d)					

INJECTION SYSTEM

Pullers attached to Dee Efficiency %

EXTRACTION SYSTEM

Electrostatic Deflector Efficiency %

CHARACTERISTIC BEAMS

	Accelerated Ions	E/A (MeV/u)	Current(part μA) Internal	External
(a)	$^1H^+$	2-7	50 μA	20 μA
(b)	$^2H^+$	4	20 μA	10 μA
(c)	$^3H^{++}$	4-11	7 μA	2 μA
(d)	$^4H^{++}$	8	7 μA	2 μA

	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 πmm mrad z πmm mrad

FACILITIES FOR RESEARCH

SHIELDED AREA: Fixed 300 m² Moveable 100 m²

Target Stations: 2 No. Served At Same Time:

MAGNETIC SPECTROMETERS: -

OTHER FACILITIES:

REFERENCES/NOTES

(a) *This cyclotron was built around 1953-54 at Univ.of Rochester USA. This has been shifted to modified and reinstalled at Chandigarh in 1971.

(b)

PLAN VIEW OF FACILITY, COMMENTS