ENTRY NO. 33

NAME OF MACHINE Chandigarh Variable Energy Cyclotron* DATE 8/21/78
INSTITUTION Physics Department, Panjab University, Chandigarh.
ADDRESS Physics Department, Panjab University, Chandigarh-160014 (India)

IN CHARGE Prof. H.S. Hans, REPORTED by Dr. I.M. Govil/Dr. T.S. Cheema.

HISTORY AND STATUS

DESIGN, date 1953 MODEL tests
ENG. DESIGN, date 1953
CONSTRUCTION, date 1965-70
FIRST BEAM date (or goal) 1971
MAJOR ALTERATIONS

OPERATION, 40 hr/wk; On Target 20 hr/wk
TIME DIST., in house %, outside %
USERS' SCHEDULING CYCLE 2 weeks
COST, ACCELERATOR $100,000
COST, FACILITY, total $200,000
FUNDED BY UGC, New Delhi-India and Panjab University, Chandigarh

ACCELERATOR STAFF, OPERATION and DEVELOPMENT

SCIENTISTS 3 ENGINEERS 2
TECHNICIANS 4 CRAFTS 4
GRAD STUDENTS involved during year
OPERATED BY Res staff or Operators
BUDGET, op & de $20,000 per annum
FUNDED BY UGC New Delhi and Panjab University, Chandigarh-India

RESEARCH STAFF, not included above

USERS, in house 6 outside 8
GRAD STUDENTS involved during year 4
RES. BUDGET, in house $15,000
FUNDED BY UGC, New Delhi and Panjab University, Chandigarh-India

FACILITIES FOR RESEARCH

SHIELDED AREA, fixed 230 m^2
movable 400 m^2
TARGET STATIONS 2 in 1 rooms
STATIONS served at same time, max 1
MAG SPECTROGRAPH, type
COMPUTER, model
OTHER FACILITIES

REFERENCES/NOTES

* This is one of the earlier cyclotron built around 1953-54 at Univ. of Rochester, Rochester, U.S.A. This has been shifted to, modified and reinstalled at Chandigarh in 1971. Ref. Sector focussed Cyclotron Conference 1959.

MAGNET

POLE FACE diameter 66 cm; R extraction 28 cm
GAP, min 16 cm; Field 14 kG
max 16 cm; Field 14 kG
} at X 10^6 ampere turns
AVERAGE FIELD at R ext 13 kG
CURRENT STABILITY 10 parts/10^6; $B_{max}/\langle B \rangle$ 14 Kg.
NUMBER OF SECTORS ; SPIRAL, max deg
POLE FACE COIL PAIRS: AVF /sec;
Harmonic correction
Rad grad /sec or Circ coils
WEIGHT: Fe 20 tons; Coils tons
CONDUCTOR, Material and type Copper
STORED ENERGY MJ
COOLING SYSTEM Chilling Plant.
POWER: Main coils 40 max, kW
Trimming coils max, kW
YOKE/POLE AREA %
SECTOR ANGLE (Sep Sec) deg
ION ENERGY (Bending limit) E/A = 7 q^2/A^2 MeV
(Focusing limit) E/A = 7 q/A MeV

ACCELERATION SYSTEM

DEES, number 1 angle 180 deg
BEAM APERTURE 2.54 cm; DC BIAS kV
TUNED by, coarse fine
RF 10 to 20 mHz, stable ± 10 /10^6
Orb F to mHz; GAIN, max kV/turn
HARMONICS, RF/Orb F, used
DEE-Gnd, max kV, min gap cm
STABILITY, (pk-pk noise)/(pk RF volt)
RF PHASE stable to ± deg
RF POWER input, max 25 kW
RF PROTECT circuit, speed μsec
Type
FREQUENCY MODULATION, rate /sec
MODULATOR, type
BEAM PULSE, width

VACUUM SYSTEM

PUMPS, No., Type, Size 4 Diffusion pumps (15.3 cm)
1 Diff. Pump 23 cm, 2 Kinney Rotary pumps.
OPERATING PRESSURE 2.5×10^{-5} mm of Hg Torr,
PUMPDOWN TIME 12 hrs

ION SOURCES/INJECTION SYSTEM

Hooded Arc Type

EXTRACTION SYSTEM

Electrostatic Deflector

CONTROL SYSTEM

Semi-mannual

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CHARACTERISTIC BEAMS

	Particle	Goal (MeV)	Achieved (MeV)
ENERGY	1 H^+	7	4-5
	2 H^+	4	4
	3 He^{++}	11	5-9
	4 He^{++}	1-8	1-8
CURRENT		(μA)	(μA)
Internal			15
External	XYZ=?		1.5-2
		(part/s)	(part/s)
Secondary			

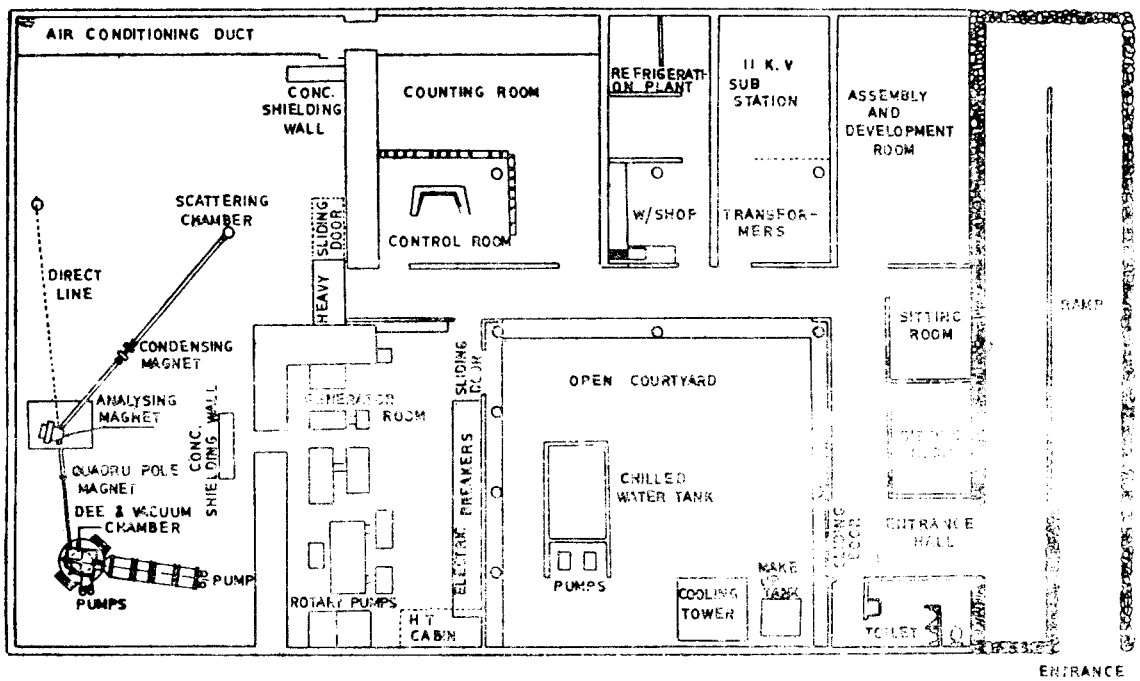
BEAM PROPERTIES

	Measured		Conditions			
Pulse Width	____ RF deg	____	μA of ____	MeV	____	
Phase Exc, max	____ RF deg	____	μA of ____	MeV	____	
Extract Eff	40 %	____	μA of ____	MeV	____	
Res, ΔE/E	0.2 %	0.1	μA of 4	MeV	Proton	
Emittance						
(mm-mrad) ____ axial, ____ radial		____	μA of ____	MeV	____	

OPERATING PROGRAMS, time dist

Basic Nuclear Physics	40 %
Solid State Physics	20 %
Bio-Medical Applications	5 %
Isotope Production	10 %
Development	25 %
	%
	%

PLAN VIEW OF FACILITY, NOTEWORTHY FEATURES, OPERATION SUMMARY, ADDITIONAL REFERENCES



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