ENTRY NO. 35
NAME OF MACHINE Chandigarh Variable Energy Cyclotron
INSTITUTION Physics Department, Panjab University, Chandigarh-160014,India.
ADDRESS Physics Department,Panjab University, Chandigarh-160014, India.
TEL 22741 TELEX
IN CHARGE Dr.T.S.Cheema REPORTED BY 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) 1st June 1971
MAJOR ALTERATIONS
COST, ACCELERATOR $ 100,000/-
COST, FACILITY, total $ 200,000/-
FUNDED BY UGC,New Delhi and Panjab Univ.

ACCELERATOR STAFF, OPERATION AND DEVELOPMENT
SCIENTISTS 3 ENGINEERS 2
TECHNICIANS 4 CRAFTS 4
GRAD STUDENTS involved during year
OPERATED BY - Research staff or Operators
OPERATION hr/wk. On target hr./wk
TIME DISTR. in house % Outside %
BUDGET, op & dev $ 20,000/- per annum
FUNDED BY UGC,New Delhi and Panjab Univ.

RESEARCH STAFF, not included above
USERS, in house 6 outside 6
GRAD STUDENTS involved during year 3
RESEARCH BUDGET, in house $ 15,000/-
FUNDED BY UGC,New Delhi and Panjab Univ.

MAGNET
POLE FACE, diameter (compact) 66 cm, R extraction 28 cm
R injection cm
GAP, min 16 cm, Field 14 kG
min 16 cm, Field 14 kG } at
AVERAGE FIELD at R ext 13 kG Ampere turns
B max/ < B > 14 Kg
NUMBER OF SECTORS { compact / separated } Spiral, max deg
SECTOR ANGLE (SSC) deg
TRIMMING COILS
CONDUCTOR, material and type Copper
STORED ENERGY (cryogenic) MJ
POWER: main coils 40 max, kW; current stability 10/10 6
trimming coils max, kW; current stability
WEIGHT: Fe 20 tons; coils tons
COOLING system Chilling plant
ION ENERGY (bending limit) E/A = 7 q^2/a^2 MEV/amu
(focusing limit) E/A = 7 q/a MeV/amu

ACCELERATION SYSTEM
DEES, number 1 180 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
HARMONICS, RF/Orb F, used
DEE—Gnd, max kV, min gap cm
STABILITY, (pk-pk noise)/(pk RF volt)
ENERGY GAIN, max kV/turn
RF PHASE, stable to ± deg
RF POWER input, max 25 kW
FREQUENCY MODULATION, rate /s
modulator, type
beam pulse, width

VACUUM SYSTEM
OPERATING PRESSURE 2×10^{-5} Torr or mbar
PUMPS, No, Type, Size 4 Diffusion pumps (15.3 cm
1 Diffusion pump 23 cm, 2 Kinney Rotary Pumps.

ION SOURCES Hooded Arc Type

INJECTION SYSTEM

EXTRACTION SYSTEM Electrostatic deflector

FACILITIES FOR RESEARCH
SHIELDED AREA, fixed 230 m²; movable 400 m²
TARGET STATIONS 2 in 1 Room
STATIONS served at same time, max 1
MAG SPECTROGRAPH, type
COMPUTER model
OTHER FACILITIES

CHARACTERISTIC BEAMS

PARTICLE	ENERGY (MeV) Goal	Achieved	CURRENT (pμA) Internal	External
$^1H^+$	7	4.5	15	1.5
$^2H^+$	4	4	15	1
$^3He^{++}$	11	5-9	10	0.5
$^4He^{++}$	1-8	1-8	10	0.5
SECONDARY		(part/s)		

BEAM PROPERTIES
MEASURED CONDITIONS 1 H^+ ions
PULSE WIDTH 40 RF deg 0.2 pμ A of 1 MeV
PHASE EXC. max RF deg pμ A of MeV
EXTRACT eff 40 % pμ A of MeV 1 H^+ ions
RESOL ΔE/E 0.2 % 0.1 pμ A of 4 MeV H^+ ions
EMITTANCE
(π mm. mrad) { axial / rad } pμ A of MeV

OPERATING PROGRAMS, time distribution (percent)
BASIC NUCLEAR PHYSICS 40 SOLID STATES PHYSICS 20
BIOMEDICAL APPLICAT 5 ISOTOPE PRODUCTIONS 10
Development 25

REFERENCES/NOTES
1)
2)

PLAN VIEW OF FACILITY, COMMENTS, ETC.
This is one of the earlier cyclotrons built around 1953-54 at University of Rochester, Rochester, U.S.A. This has been later on shifted to, modified and reinstalled at Chandigarh, India in 1971. Earlier reference as reported in ''Sector focussed Cyclotron Conference,1959'' For the plan view of facility refered to ''Survey Cyclotron,1978''.