

ENTRY No. 33

NAME OF MACHINE Chandigarh Variable Energy Cyclotron DATE July 1981
INSTITUTION Physics Department, Panjab University, Chandigarh.
ADDRESS Physics Department, Panjab University, Chandigarh - 160014, INDIA.
TEL TELEX
IN CHARGE Prof. H. S. Hans REPORTED BY Dr. I. M. Govil

HISTORY AND STATUS

DESIGN, date 1953 Model tests \*
ENG DESIGN, date 1953
CONSTRUCTION, date 1965-70
FIRST BEAM, date (or goal) 1971
MAJOR ALTERATIONS Vacuum system and Cavity Coupling arrangement.
COST, ACCELERATOR 250,000
COST, FACILITY, total 400,000
FUNDED BY UGC, New Delhi-India and P.U. Chandigarh.

ACCELERATOR STAFF, OPERATION AND DEVELOPMENT
SCIENTISTS 4 ENGINEERS 4
TECHNICIANS 5 CRAFTS 4
GRAD STUDENTS involved during year 6
OPERATED BY 2 Research staff or 2 Operators
OPERATION 60 hr/wk, On target 50 hr/wk
TIME DISTR. in house 75 % , Outside 25 %
BUDGET, op & dev 20,000 per annum
FUNDED BY UGC, New Delhi and P.U. Chandigarh-India.

RESEARCH STAFF, not included above
USERS, in house 9 outside 5
GRAD STUDENTS involved during year 8
RESEARCH BUDGET, in house 15,000
FUNDED BY UGC, New Delhi and Panjab University Chandigarh-India.
POLE FACE, diameter (compact) 66cm, R extraction 28 cm
R injection 0 cm
GAP, min 1.6 cm, Field 1.4 kG
max 1.6 cm, Field 1.4 kG } at
AVERAGE FIELD at R ext 1.3 kG } Ampere turns
B max/ <B>
NUMBER OF SECTORS { compact } Spiral, max deg
{ separated }
SECTOR ANGLE (SSC) deg
TRIMMING COILS

CONDUCTOR, material and type
STORED ENERGY (cryogenic) MJ
POWER: main coils 40 max, kW ; current stability
trimming coils max, kW ; current stability
WEIGHT : Fe 20 tons ; coils tons
COOLING system
ION ENERGY (bending limit) E/A = 8 q^2/a^2 MeV/amu
(focusing limit) E/A = 8 q/a MeV/amu

ACCELERATION SYSTEM

DEES, number 1 ; angle 180 deg
BEAM APERTURE 2.54 cm ; DC Bias 10 kV
TUNED by, coarse fine
RF 10 to 20 mHz, stable +/- 1/10^5
Orb F to mHz
HARMONICS, RF/Orb F, used
DEE - Gnd, max 40 kV, min gap 2.5 cm
STABILITY, (pk-pk noise)/(pk RF volt)
ENERGY GAIN, max 80 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 mm of Hg Torr or mbar
PUMPS, No, Type, Size 4 Diffusion pumps (15, 3 cm)
1 Diff. Pump 23 cm, 2 Kinney Rotary pumps

ION SOURCES

Hooded Arc Type

INJECTION SYSTEM

Pullers attached to Dee

EXTRACTION SYSTEM

Electrostatic Deflector

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 55 cc Ge(Li) Detector
4096 Multichannel analyzer
and associated electronics

CHARACTERISTIC BEAMS

Table with columns: PARTICLE, ENERGY (MeV) Goal, Achieved, CURRENT (pA) Internal, External. Rows include 1H+, 2H+, 3H+, 4H+, 4H++ and a SECONDARY row.

BEAM PROPERTIES

MEASURED CONDITIONS
PULSE WIDTH RF deg pA of MeV ions
PHASE EXC, max RF deg pA of MeV ions
EXTRACT eff 40 % pA of MeV ions
RESOL Delta E/E 0.2 % 0.1 pA of 4 MeV protons
EMITTANCE
(pi mm. mrad) { axial } pA of MeV ions
{ rad }

OPERATING PROGRAMS, time distribution

BASIC NUCLEAR PHYSICS 40 SOLID STATES PHYSICS 20
BIOMEDICAL APPLICAT. 5 ISOTOPE PRODUCTIONS 10

REFERENCES/NOTES

\*This cyclotron was built around 1953-54 at Univ of Rochester, U.S.A. This has been shifted to, modified and reinstalled at Chandigarh in 1971.

PLAN VIEW OF FACILITY, NOTEWORTHY FEATURES, COMMENTS

