ENTRY NO. 2

NAME OF MACHINE Ghent University isochronous cyclotron DATE 15.1.1979
INSTITUTION Institute for Nuclear Sciences, Rijksuniversiteit Gent
ADDRESS Proeftuinstraat 86, B-9000 Gent, Belgium

IN CHARGE J.Hoste ; C. Vandecasteele REPORTED by C. Vandecasteele

HISTORY AND STATUS

DESIGN, date 1974 MODEL tests
ENG. DESIGN, date 1975
CONSTRUCTION, date 1976-77
FIRST BEAM date (or goal) 17 June 1977
MAJOR ALTERATIONS

OPERATION, 40 hr/wk; On Target 30 hr/wk
TIME DIST., in house %, outside %
USERS' SCHEDULING CYCLE weeks
COST, ACCELERATOR
COST, FACILITY, total
FUNDED BY NFWO a) and University

ACCELERATOR STAFF, OPERATION and DEVELOPMENT

SCIENTISTS 1 ENGINEERS 1
TECHNICIANS 2 CRAFTS 1
GRAD STUDENTS involved during year
OPERATED BY Res staff or Operators
BUDGET, op & dev
FUNDED BY IIKW b) and University

RESEARCH STAFF, not included above

USERS, in house 10 outside
GRAD STUDENTS involved during year 2
RES. BUDGET, in house
FUNDED BY IIKW

FACILITIES FOR RESEARCH

SHIELDED AREA, fixed 85 m^2
movable m^2
TARGET STATIONS 3 in 3 rooms
STATIONS served at same time, max 1
MAG SPECTROGRAPH, type
COMPUTER, model
OTHER FACILITIES Hot chemistry laborat., measuring room with 2 Ge(Li)detect. + IN-90 γ-spectrometer, pneumatic transfer system for activation analysis, PIXE set-up

REFERENCES/NOTES

a) Nationaal Fonds voor Wetenschappelijk Onderzoek
b) Interuniversitair Instituut voor Kernwetenschappen
c) max = 150 000 ampere turns
d) without gas supply : 1 μ Torr

MAGNET

POLE FACE diameter 120 cm; R extraction 52.5 cm
GAP, min 8.6 cm; Field 17.5 kG
max 14 cm; Field 11.0 kG
at 150 X 10^6 ampere turns c)
AVERAGE FIELD at R ext 14.8 kG
CURRENT STABILITY 10 parts/10^6; $B_{max}/\langle B \rangle$ 1.18
NUMBER OF SECTORS 4 ; SPIRAL, max 34 deg
POLE FACE COIL PAIRS: AVF /sec;
Harmonic correction 4 coils
Rad grad /sec or Circ coils 7
WEIGHT: Fe 28 tons; Coils tons
CONDUCTOR, Material and type Cu
STORED ENERGY MJ
COOLING SYSTEM demineralised water
POWER: Main coils 65 max, kW
Trimming coils 10 max, kW
YOKE/POLE AREA %
SECTOR ANGLE (Sep Sec) deg
ION ENERGY (Bending limit) E/A = 29 q^2/A^2 MeV
(Focusing limit) E/A = q/A MeV

ACCELERATION SYSTEM

DEES, number 2 angle 50 deg
BEAM APERTURE 2.5 cm; DC BIAS kV
TUNED by, coarse piston fine panel
RF 20 to 41 mHz, stable ± 1 /10^6
Orb F 5.1 to 20.2 mHz; GAIN, max 100 kV/turn
HARMONICS, RF/Orb F, used 2 - 3 - 4
DEE-Gnd, max 30 kV, min gap 2 cm
STABILITY, (pk-pk noise)/(pk RF volt) $5\ 10^{-4}$
RF PHASE stable to ± 0.2 deg
RF POWER input, max 30 kW
RF PROTECT circuit, speed μsec
Type
FREQUENCY MODULATION, rate /sec
MODULATOR, type
BEAM PULSE, width

VACUUM SYSTEM

PUMPS, No., Type, Size Balzers BP 800 011 PF 7310 DIF 320 3000 l/s
OPERATING PRESSURE 20 μTorr d)
PUMPDOWN TIME 2.5 hrs

ION SOURCES/INJECTION SYSTEM

Livingston-Jones ; axial

EXTRACTION SYSTEM

Electrostatic deflector; V_{max} = 50 kV

CONTROL SYSTEM

conventional

ENTRY NO. 2 (cont.)

CHARACTERISTIC BEAMS

	Particle	Goal (MeV)	Achieved (MeV)
ENERGY	p	6-21	2.5-24
	d	3-13.5	3-14.5
	^{3}He	6-31	6-32
	α	10-27	10-29
CURRENT		(μA)	(μA)
Internal			
External	p	50	100
	d	70	100
	^{3}He	30	60
	α	50 (part/s)	60 (part/s)
Secondary			

BEAM PROPERTIES

	Measured		Conditions			
Pulse Width	____	RF deg	____	μA of ____	MeV	____
Phase Exc, max	____	RF deg	____	μA of ____	MeV	____
Extract Eff	60-70	%	25	μA of 7	MeV	d
Res, ΔE/E	____	%	____	μA of ____	MeV	____

Emittance

(mm-mrad) { ____ axial / ____ radial } ____ μA of ____ MeV ____

OPERATING PROGRAMS, time dist

Basic Nuclear Physics	%
Solid State Physics	%
Bio-Medical Applications	%
Isotope Production 25	%
Development	%
Activation analysis 50	%
PIXE 25	%

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