ENTRY No. 6

NAME OF MACHINE Chalk River Superconducting Cyclotron DATE 1981 August 12
INSTITUTION Atomic Energy of Canada Limited
ADDRESS Chalk River, Ontario, Canada
TEL 613-584-3311 TELEX 053-34555
IN CHARGE J.H. Ormrod REPORTED BY J.H. Ormrod

HISTORY AND STATUS

DESIGN, date 1973 Model tests 1974-1978
ENG DESIGN, date 1974-1977
CONSTRUCTION, date 1978 (Magnet and Rf Structure)
FIRST BEAM, date (or goal) 1983
MAJOR ALTERATIONS

COST, ACCELERATOR $2.4 M Canadian
COST, FACILITY, total $12 M Canadian
FUNDED BY Atomic Energy of Canada Limited

ACCELERATOR STAFF, OPERATION AND DEVELOPMENT

SCIENTISTS and ENGINEERS 8
TECHNICIANS 10 CRAFTS
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
FUNDED BY

RESEARCH STAFF, not included above

USERS, in house outside
GRAD STUDENTS involved during year
RESEARCH BUDGET, in house
FUNDED BY

MAGNET

POLE FACE, diameter (compact) 138.6 cm, R extraction 65. cm
R injection 14.5-22. cm
GAP, min 3.7 cm, Field 60 kG
max 64 cm, Field 43 kG
AVERAGE FIELD at R ext 50 kG
} at 5.4 x 10^6 Ampere turns
B max/ <B> 1.2 - 1.7
NUMBER OF SECTORS { compact 4 / separated } Spiral, max 50 deg
SECTOR ANGLE (SSC) deg
TRIMMING COILS 13 trim rods per flutter pole
CONDUCTOR, material and type Nb-Ti
STORED ENERGY (cryogenic) 22 MJ
POWER : main coils max, kW ; current stability
trimming coils max, kW ; current stability
WEIGHT : Fe 170 tons ; coils 10 tons
COOLING system Liquid Helium Bath
ION ENERGY (bending limit) E/A = 520 q^2/a^2 MeV/amu
(focusing limit) E/A = 100 q /a MeV/amu

ACCELERATION SYSTEM

DEES, number 4 ; angle ~ 40 deg
BEAM APERTURE 3.2 cm ; DC Bias 0 kV
TUNED by, coarse sliding short fine variable capacitor
RF 31 to 62 mHz, stable ± $1/10^6$
Orb F 5.9 to 23.4 mHz
HARMONICS, RF/Orb F, used 2, 4, 6
DEE - Gnd, max 100 kV, min gap 3 cm
STABILITY, (pk-pk noise)/(pk RF volt) $1:10^4$
ENERGY GAIN, max 25,000 kV/turn
RF PHASE, stable to ± deg
RF POWER input, max 100 kW
FREQUENCY MODULATION, rate /s
modulator, type
beam pulse, width

VACUUM SYSTEM

OPERATING PRESSURE 5×10^{-7} Torr or mbar
PUMPS, No, Type, Size 2 cryopanels @ ~ 1000 ℓ/s each

ION SOURCES

13 MV tandem Van de Graaff

INJECTION SYSTEM

Carbon stripper after radial injection

EXTRACTION SYSTEM

Orbit perturbation, electrostatic deflector, magnetic channel

FACILITIES FOR RESEARCH

SHIELDED AREA, fixed m² ; movable m²
TARGET STATIONS in rooms
STATIONS served at same time, max
MAG SPECTROGRAPH, type
COMPUTER model
OTHER FACILITIES

CHARACTERISTIC BEAMS

PARTICLE	ENERGY (MeV) Goal	Achieved	CURRENT (pμA) Internal	External
C^{12}	600			0.200
U^{238}	2380			0.004
SECONDARY			(part/s)	

BEAM PROPERTIES

	MEASURED	CONDITIONS
PULSE WIDTH	RF deg	pμ A of MeV ions
PHASE EXC, max	RF deg	pμ A of MeV ions
EXTRACT eff	%	pμ A of MeV ions
RESOL ΔE/E	%	pμ A of MeV ions
EMITTANCE (π mm. mrad)	{ axial / rad }	pμA of MeV ions

OPERATING PROGRAMS, time distribution

BASIC NUCLEAR PHYSICS SOLID STATES PHYSICS
BIOMEDICAL APPLICAT. ISOTOPE PRODUCTIONS

REFERENCES/NOTES

J.H. Ormrod et al. (these proceedings)

PLAN VIEW OF FACILITY, NOTEWORTHY FEATURES, COMMENTS