

ENTRY No. C 57

NAME OF MACHINE IM Radial Ridge DATE July 1989
INSTITUTION School of Physics & Space Research
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HISTORY AND STATUS

DESIGN, date 1957 Model tests None
ENG DESIGN, date 1957-63
CONSTRUCTION, date 1958-63
FIRST BEAM, date (or goal) Int. 1963, Ext. 1963
MAJOR ALTERATIONS
COST, ACCELERATOR £ 30 K
COST, FACILITY, total
FUNDED BY SERC/since 1988 self funding
ACCELERATOR STAFF, OPERATION AND DEVELOPMENT
SCIENTISTS ENGINEERS 1
TECHNICIANS 2 CRAFTS 1
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 £ 15 K
FUNDED BY self funded
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) 102 cm, R extraction .46 cm
R injection cm
GAP, min .7 cm, Field 19 kG }
max 14.5 cm, Field 13 kG } at
AVERAGE FIELD at R ext 16 kG } Ampere turns
B max/ 1.2 }
NUMBER OF SECTORS { compact 3 } radial
{ separated } Spoke, max .. deg
SECTOR ANGLE (SSC) deg
TRIMMING COILS Harmonic 2
Circular 8
CONDUCTOR, material and type Cu Strip
STORED ENERGY (cryogenic) MJ
POWER: main coils .40 max, kW; current stability
trimming coils max, kW; current stability
WEIGHT: Fe .50 tons; coils .8 tons
COOLING system H₂O
ION ENERGY (bending limit) E/A = q²/a² MeV/amu
(focusing limit) E/A = q²/a² MeV/amu
ACCELERATION SYSTEM
DEES, number 1; angle 180 deg
BEAM APERTURE 2-3 cm; DC Bias 7 kV
TUNED by, coarse M.S fine M.S
RF 12 to 16 MHz, stable ± 2/10⁶
Orb F 12 to 16 MHz
HARMONICS, RF/Orb F, used 1
DEE - Gnd, max 27 kV, min gap 0.3 cm
STABILITY, (pk-pk noise)/(pk RF volt) 0.001
ENERGY GAIN, max 54 kV/turn
RF PHASE, stable to ± 3 deg
RF POWER input, max 45 kW
FREQUENCY MODULATION, rate /s
modulator, type
beam pulse, width
VACUUM SYSTEM
OPERATING PRESSURE 4 x 10⁻⁶ Torr or mbar
PUMPS, No, Type, Size 1 x 40 cm
2 x 22 cm Silicon Oil Diff.
ION SOURCES
Internal Hot Cathode, polarized external source
de-commissioned

INJECTION SYSTEM

Axial
EXTRACTION SYSTEM
Mag/Plect. Regenerator & Plect. Def.
FACILITIES FOR RESEARCH
SHIELDED AREA, fixed 90 m²; movable 0 m²
TARGET STATIONS 6 in 1 rooms
STATIONS served at same time, max 1
MAG SPECTROGRAPH, type
COMPUTER model GEC
OTHER FACILITIES 10 Mass Ident System
using counter telescopes

CHARACTERISTIC BEAMS

PARTICLE	ENERGY (MeV)		CURRENT (pA)	
	Goal	Achieved	Internal	External
⁴ He		25	300	150
³ He		33	300	150
D ⁺		12.5	800	
P		6.5	600	

SECONDARY (part/s)

BEAM PROPERTIES

MEASURED	CONDITIONS	
	PULSE WIDTH	PHASE EXC, max
.30 RF deg	10 pA of .33 MeV ³ He ions	
.15 RF deg	10 pA of MeV ions	
.60 %	pA of MeV ions	
.0.4 %	pA of MeV ions	

EMITTANCE
(π mm. mrad) { .40 axial }
{ .40 rad } pA of MeV ions

OPERATING PROGRAMS, time distribution
BASIC NUCLEAR PHYSICS .30% SOLID STATES PHYSICS .40%
BIOMEDICAL APPLICAT. 10% ISOTOPE PRODUCTIONS 60%

REFERENCES/NOTES

PLAN VIEW OF FACILITY, NOTEWORTHY FEATURES, COMMENTS

Although this machine was used in the nuclear structure field it now concentrates mainly on isotope production producing ⁸¹Kr, ⁵²Fe, ⁵⁷Co, ²²Ne. Isotopes are produced internally and externally.

Polarized D⁺, He³ external source has been de-commissioned.