

ENTRY NO. 54

NAME OF MACHINE .160 cm Cyclotron
 INSTITUTION .RIKEN(Institute of Physical and Chemical Research)
 ADDRESS .Hirosawa 2-1, Wako-shi, 351-01 Japan
 TEL .0484-62-1111 TELEX
 IN CHARGE . REPORTED BY Jap. J. Appl. Phys. 9, p532, 1970.

HISTORY AND STATUS

DESIGN, date Model tests
 ENG DESIGN, date
 CONSTRUCTION, date
 FIRST BEAM, date (or goal) Oct. 1966
 MAJOR ALTERATIONS

COST, ACCELERATOR
 COST, FACILITY, total
 FUNDED BY Japanese Government

ACCELERATOR STAFF, OPERATION AND DEVELOPMENT

SCIENTISTS 1 ENGINEERS 6
 TECHNICIANS CRAFTS
 GRAD STUDENTS involved during year
 OPERATED BY Research staff or Operators
 OPERATION 120 hr/wk. On target hr/wk
 TIME DISTR, in house 80 %, outside 20 %
 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) 162 cm, R-extraction 73 cm
 R injection cm
 GAP, min 25 cm, Field 20 kG
 max cm, Field kG } at max excitation
 AVERAGE FIELD at R ext kG }
 B max / < B > 6x10⁵ Ampere turns

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 400 max kW: current stability 10⁻⁴
 trimming coils max kW: current stability
 WEIGHT: Fe 310 tons: coils 20 tons
 COOLING system
 ION ENERGY (Bending limit) E/A = 90 q²/A² MeV/amu
 (Focusing limit) E/A = q/A MeV/amu

ACCELERATION SYSTEM

DEES, number 2 angle 180 deg
 BEAM APERTURE 5 cm; DC Bias kV
 TUNED by, coarse fine
 RF 6 to 12.5 MHz, stable ±
 Orb F to MHz
 HARMONICS, RF/Orb F, used
 DEE-Gnd, max 100 kV, min gap cm
 STABILITY, (pk-pk noise)/(pk RF volt)
 ENERGY GAIN, max 400 kV/turn
 RF PHASE, stable to ± deg
 RF POWER input, max 150 kW
 FREQUENCY MODULATION, rate /s
 modulator, type
 beam pulse, width

VACUUM SYSTEM

OPERATING PRESSURE 1 x 10⁻⁶ Torr Torr or mbar
 PUMPS, No, Type, Size 32" Oil D.P.

For light ions(H, He) Livingston type
ION SOURCES For heavy ions(Gas) Electron bombarded hot cathode PIG type
 For heavy ions(Solid) Same with sputtering electrode

INJECTION SYSTEM

EXTRACTION SYSTEM

FACILITIES FOR RESEARCH

SHIELDED AREA, fixed m²; movable m²
 TARGET STATIONS 12 in 3 rooms
 STATIONS served at same time, max
 MAG SPECTROGRAPH, type
 COMPUTER model
 OTHER FACILITIES

CHARACTERISTIC BEAMS

PARTICLE	ENERGY (MeV)		CURRENT (pμA)	
	Goal	Achieved	Internal	External
P		17		30
³ He ⁺⁺		50		15
¹² C ⁴⁺		100		0.3
²⁰ Ne ⁶⁺		150		0.02
SECONDARY			(part/s)	

BEAM PROPERTIES

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

OPERATING PROGRAMS, time distribution

BASIC NUCLEAR PHYSICS SOLID STATES PHYSICS
 BIOMEDICAL APPLICAT. ISOTOPE PRODUCTIONS

REFERENCES/NOTES

- 1)
- 2)

PLAN VIEW OF FACILITY, COMMENTS, ETC.