

**ENTRY NO. 46**

NAME OF MACHINE .750 CYCLOTRON  
 INSTITUTION .Nihon Medi-Physics Co., Ltd Chiba Facility  
 ADDRESS .3-1 Kitasode Sodegaura Township Chiba Japan  
 TEL .0438-63-4771 TELEX  
 IN CHARGE .S.Nakamoto REPORTED BY .M.Takahashi

**HISTORY AND STATUS**

DESIGN, date . Model tests  
 ENG DESIGN, date . Sumitomo, CGR MeV 750PV  
 CONSTRUCTION, date . Sep. 1985  
 FIRST BEAM, date (or goal) Jun. 1986  
 MAJOR ALTERATIONS

COST, ACCELERATOR  
 COST, FACILITY, total  
 FUNDED BY

**ACCELERATOR STAFF, OPERATION AND DEVELOPMENT**

SCIENTISTS . ENGINEERS . 5  
 TECHNICIANS . 7 . CRAFTS  
 GRAD STUDENTS involved during year  
 OPERATED BY . Research staff or . 11 Operators  
 OPERATION . 50 hr/wk. On target . 40 hr/wk  
 TIME DISTR. in house . 100 % , 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) . 180 cm, R-extraction . 75 cm  
 R injection . cm  
 GAP, min . 13.3 cm, Field . 20 kG }  
 max . 31.5 cm, Field . 15.7 kG } at 263,000  
 AVERAGE FIELD at R ext . 16.4 kG } Ampere turns  
 B max / < B >

NUMBER OF SECTORS { compact . 4 } Spiral, max . deg  
 { separated . }  
 SECTOR ANGLE (SSC) . deg

TRIMMING COILS . Harmonic Coils . 4 pairs  
 . Circular Coils . 10 pairs

CONDUCTOR, material and type . OF Cu, hollow conductor  
 STORED ENERGY (cryogenic) . MJ

POWER: main coils . 105 max kW: current stability .  $2 \times 10^{-5}$   
 trimming coils . 10 max kW: current stability .  $5 \times 10^{-4}$

WEIGHT: Fe . 120 tons: coils . 6 tons  
 COOLING system . Deionized Water . 700 l/m.at . 8 kg/cm<sup>2</sup>

ION ENERGY (Bending limit) E/A = .  $q^2/A^2$  MeV/amu  
 (Focusing limit) E/A = . q/A MeV/amu

**ACCELERATION SYSTEM**

DEES, number . 2 . angle . 83 deg  
 BEAM APERTURE . 2.4 cm; DC Bias . 10 kV  
 TUNED by, coarse . Shorting plate fine . Compensator  
 RF . 13 to 25 MHz, stable  $\pm 10^{-7}$   
 Orb F . to MHz  
 HARMONICS, RF/Orb F, used . H=1 (proton)  
 DFF-Gnd, max . 50 kV, min gap . 3.95 cm  
 STABILITY, (pk-pk noise)/(pk RF volt) .  $\pm 10^{-3}$   
 ENERGY GAIN, max . 127 kV/turn  
 RF PHASE, stable to  $\pm 0.1$  deg  
 RF POWER input, max . 80 kW  
 FREQUENCY MODULATION, rate . /s  
 modulator, type  
 beam pulse, width

**VACUUM SYSTEM**

OPERATING PRESSURE .  $2 \times 10^{-5}$  Torr or mbar  
 PUMPS, No, Type, Size . 2000 l/s 2 sets

**ION SOURCES**

. Axial Livingstones Type

**INJECTION SYSTEM**

**EXTRACTION SYSTEM**

. Deflector, Magnetic Channel, Gradient Correc-  
**FACILITIES FOR RESEARCH** . ter

SHIELDED AREA, fixed . 136 m<sup>2</sup>; movable . m<sup>2</sup>  
 TARGET STATIONS . 6 in . 1 rooms  
 STATIONS served at same time, max . 1  
 MAG SPECTROGRAPH, type  
 COMPUTER model . Intel 310  
 OTHER FACILITIES

**CHARACTERISTIC BEAMS**

PARTICLE	ENERGY (MeV)		CURRENT (pμA)	
	Goal	Achieved	Internal	External
p		.70	200	55
p		.25	200	100
SECONDARY			(part/s)	

**BEAM PROPERTIES**

	MEASURED		CONDITIONS	
	RF deg	μA of	MeV	ions
PULSE WIDTH				
PHASE EXC, max	RF deg	μA of	MeV	ions
EXTRACT eff	80 %	50	μA of 70 MeV	p ions
RESOL ΔE/E	%		μA of MeV	ions
EMITTANCE				
(π mm-mrad)	axial	μA of	MeV	
	rad			

**OPERATING PROGRAMS, time distribution**

BASIC NUCLEAR PHYSICS . . . . . SOLID STATES PHYSICS . . . . .  
 BIOMEDICAL APPLICAT. . . . . ISOTOPE PRODUCTIONS . 100 %

**REFERENCES/NOTES**

- 1)
- 2)

**PLAN VIEW OF FACILITY, COMMENTS, ETC.**