ENTRY NO. 39

NAME OF MACHINE: NMP cyclotron 3 (480P)

INSTITUTION: Nihon Medi-Physics Co., Ltd., Chiba facility

ADDRESS: 3-1, Kitasode, Sodegaura-cho, Kimitsu-gun, Chiba Pref, 299-02

TEL: 0438-63-4771 TELEX:

IN CHARGE: M. Hazue REPORTED BY: S. Nakamoto

HISTORY AND STATUS

DESIGN, date: 1983 Aug. Model tests:

ENG DESIGN, date:

CONSTRUCTION, date: 1984 Nov. -

FIRST BEAM, date (or goal): (1985 May)

MAJOR ALTERATIONS:

COST, ACCELERATOR:

COST, FACILITY, total:

FUNDED BY: Nihon Medi-Physics Co., Ltd.

ACCELERATOR STAFF, OPERATION AND DEVELOPMENT

SCIENTISTS: ENGINEERS: 2

TECHNICIANS: 4 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): 115 cm, R extraction: 48 cm

R injection: cm

GAP, min 8.6 cm, Field: 21 kG

min 14.8 cm, Field: kG at 160,000 Ampere turns

AVERAGE FIELD at R ext: 16.6 kG

B max/ < B >:

NUMBER OF SECTORS: compact 4; separated: Spiral, max: deg

SECTOR ANGLE (SSC): deg

TRIMMING COILS: Harmonic 4 pairs 30 A max

Circular 6 pairs 20 A max

CONDUCTOR, material and type:

STORED ENERGY (cryogenic): MJ

POWER: main coils: max, kW; current stability:

trimming coils: max, kW; current stability:

WEIGHT: Fe: 28 tons; coils: tons

COOLING system: Circulated deionized water

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 83 deg

BEAM APERTURE: 2.2 cm; DC Bias: kV

TUNED by, coarse: fine:

RF: to 24.55 mHz, stable ± 2 x 10^{-5}

Orb F: to mHz

HARMONICS, RF/Orb F, used:

DEE—Gnd, max: 40 kV, min gap: 2.15 cm

STABILITY, (pk-pk noise)/(pk RF volt):

ENERGY GAIN, max: kV/turn

RF PHASE, stable to ±: deg

RF POWEP input, max: 18 x 2 kW

FREQUENCY MODULATION, rate: /s

modulator, type:

beam pulse, width:

VACUUM SYSTEM

OPERATING PRESSURE: 2 x 10^{-5} Torr or mbar

PUMPS, No, Type, Size:

diffusion pump 2000 ℓ/s x 1

rotary pump 40 m^3/h x 1

ION SOURCES

Livingstone-Jones type

INJECTION SYSTEM

EXTRACTION SYSTEM

Deflector & magnet channel

FACILITIES FOR RESEARCH

SHIELDED AREA, fixed 12 x 7.5 m^2; movable: m^2

TARGET STATIONS: 5 in 1 room

STATIONS served at same time, max:

MAG SPECTROGRAPH, type:

COMPUTER model:

OTHER FACILITIES:

CHARACTERISTIC BEAMS

PARTICLE	ENERGY (MeV) Goal	Achieved	CURRENT (pμA) Internal	External
Proton	28		200 μA	80 μA
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	pμ A of MeV

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.