ENTRY NO. 54
NAME OF MACHINE Automatic Isochoneus Cyclotron/AIC-144/
INSTITUTION Institut of Nuclear Physics
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IN CHARGE J. Schwabe REPORTED BY J. Schwabe

HISTORY AND STATUS
DESIGN, date 1976-78 Model tests 1977-79
ENG DESIGN, date 1979
CONSTRUCTION, date 1980-85
FIRST BEAM, date (or goal) 1985-86
MAJOR ALTERATIONS
COST, ACCELERATOR
COST, FACILITY, total
FUNDED BY

ACCELERATOR STAFF, OPERATION AND DEVELOPMENT
SCIENTISTS 7 ENGINEERS 12
TECHNICIANS 7 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) 144. cm, R extraction 63,5 cm
R injection 0,5÷1 cm
GAP, min 11.2 cm, Field 20.5 kG
min 22 cm, Field 14.5 kG } at 710(A)X672(W) Ampere turns
AVERAGE FIELD at R ext 17.5 kG
B max/ < B > 1.17
NUMBER OF SECTORS { compact 4 / separated } Spiral, max 54 deg
SECTOR ANGLE (SSC) 45 deg
TRIMMING COILS circular 20 (10)
valley coils 8
CONDUCTOR, material and type Cu
STORED ENERGY (cryogenic) MJ
POWER: main coils 240 max, kW; current stability 4X10-5
trimming coils 120 max, kW; current stability 10-5
WEIGHT: Fe 150 tons; coils 2x7.55 tons
COOLING system
ION ENERGY (bending limit) E/A = 60 (56) q^2/a^2 MEV/amu
(focusing limit) E/A = 60 (56) q/a MeV/amu

ACCELERATION SYSTEM
DEES, number 1 180 deg
BEAM APERTURE 16 cm; DC Bias kV
TUNED by, coarse panels fine trimmers capact.
RF 8 to 26 mHz, stable ± 10-7
Orb F 8 to 26 mHz
HARMONICS, RF/Orb F, used 1
DEE—Gnd, max 50 kV, min gap 2.79 cm
STABILITY, (pk-pk noise)/(pk RF volt) 10-4
ENERGY GAIN, max 100 kV/turn
RF PHASE, stable to ± 15÷45 deg
RF POWEP input, max 150 kW
FREQUENCY MODULATION, rate 10÷1000 /s
modulator, type
beam pulse, width μ-structure; 15.6÷4.8 ns, pulse: 1.25μs

VACUUM SYSTEM
OPERATING PRESSURE ~ 2 X 10^{-6} Torr or mbar
PUMPS, No, Type, Size 2 diffusion oil pumps: 4800 L/S

ION SOURCES
Horizontal: Penning, External: ECR-System

INJECTION SYSTEM
Internal or external with electrostatic inflector

EXTRACTION SYSTEM
Electrostatic deflector 3 sector

FACILITIES FOR RESEARCH
SHIELDED AREA, fixed m^2; movable m^2
TARGET STATIONS in
STATIONS served at same time, max
MAG SPECTROGRAPH, type
COMPUTER model
OTHER FACILITIES

CHARACTERISTIC BEAMS

PARTICLE	ENERGY (MeV) Goal	Achieved	CURRENT (pμA) Internal	External
	p		130	100
	d		130	100
	α		70	50
	$C^{12}, N^{14} O^{16}$		10÷20	5÷15
SECONDARY		(part/s)		
	n			

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)	8 axial / 8,5 rad	80 pμ A of 56 MeV p.d.

OPERATING PROGRAMS, time distribution
BASIC NUCLEAR PHYSICS SOLID STATES PHYSICS
BIOMEDICAL APPLICAT ISOTOPE PRODUCTIONS

REFERENCES/NOTES
1) International seminar on isochroneus Cyclotron technique
Poland Krakow J.N.PH. 13÷18 Nov,1978
report JFJ No. 1069/PL

PLAN VIEW OF FACILITY, COMMENTS, ETC.