

ENTRY NO. 66

NAME OF MACHINE Automatic Isochroneus Cyclotron/AIC-144
 INSTITUTION Institut of Nuclear Physics
 ADDRESS Krakow, Poland, Radzikowskiego 152
 TEL 37 02 22 TELEX
 IN CHARGE J. Schwade REPORTED BY J. Schwade

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 }
 max 22 . . cm, Field . . 14.5 . kG } at . . 710(A) x 672(W)
 AVERAGE FIELD at R ext 17.5 . kG } Ampere turns
 B max / < B > 1.17

NUMBER OF SECTORS { compact 4 . . . } Spiral, max . 54 deg
 { separated }
 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 4×10^{-5}
 trimming coils . 120 . max kW: current stability 10^{-5}

WEIGHT: Fe . . . 150 tons: coils . . 2 x 7.55 tons
 COOLING system

ION ENERGY (Bending limit) E/A = . 60 . (56) q²/A² MeV/amu
 (Focusing limit) E/A = . 60 . (56) q/A MeV/amu

ACCELERATION SYSTEM

DEES, number . . . 1 angle 180 deg
 BEAM APERTURE . 16 cm; DC Bias kV
 TUNED by, coarse . panels fine trimmers capac.
 RF 8 to 26 MHz, stable $\pm 10^{-7}$
 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 \pm 15+45 deg
 RF POWER input, max. 150 kW
 FREQUENCY MODULATION, rate 10+1000 /s
 modulator, type
 beam pulse, width . μ -structure; 15.6+4.8 ns, pulse; 1.25 μ s

VACUUM SYSTEM

OPERATING PRESSURE 2×10^{-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 m²; movable m²
 TARGET STATIONS in rooms
 STATIONS served at same time, max
 MAG SPECTROGRAPH, type
 COMPUTER model
 OTHER FACILITIES

CHARACTERISTIC BEAMS

PARTICLE	ENERGY (MeV)		CURRENT (μ A)	
	Goal	Achieved	Internal	External
p			130	100
d			130	100
α			70	50
C ¹² , N ¹⁴ O ¹⁶			10+20	5+15
SECONDARY			(part/s)	
p				

BEAM PROPERTIES

MEASURED CONDITIONS
 PULSE WIDTH . . . RF deg μ A of MeV ions
 PHASE EXC. max . . RF deg μ A of MeV ions
 EXTRACT eff. % μ A of MeV ions
 RESOL $\Delta E/E$ % μ A of MeV ions
 EMITTANCE
 (π mm-mrad) . 8 . axial
 . 8.5 rad . 80 . μ 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
 Poland Krakow J.N.PH. 13+18 Nov., 1978
- 2) Cyclotron technique
 report JFJ No. 1069/PL

PLAN VIEW OF FACILITY, COMMENTS, ETC.

