

ENTRY NO. 63

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 . 0,5-1m
 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 x 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 trimers . capac.
 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 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 μs

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 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 (pμA)	
	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)	
n				

BEAM PROPERTIES

	MEASURED		CONDITIONS	
	RF deg		RF deg	
PULSE WIDTH		pμ A of		MeV ions
PHASE EXC. max		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		80 . pμ A of	56 . MeV p.d. . .
	8, 5 . rad			

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.

