ENTRY No. C40

NAME OF MACHINE Automatic Isochronous Cyclotron(AIC-144) DATE .....
INSTITUTION ..... Institute of Nuclear Physics .....
ADDRESS ..... Krakow, Poland, Radzikowskiego 152 .....
TEL ..37 02 22..... TELEX .....
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) ...10.04.87.....
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 } at710(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.....15.....
.....valley.....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). q^2/a^2 MeV/amu
(focusing limit) E/A = 60 (56). q^2/a^2 MeV/amu

ACCELERATION SYSTEM
DEES, number .....1..... ; angle .....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 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 $6 \cdot 10^{-6}$ ..... Torr or mbar
PUMPS, No, Type, Size 2 diffusion oil pumps . 4800 L/S ..
.....
.....

ION SOURCES
.....Penning.....Internal.....

INJECTION SYSTEM
Internal or external with electrostatic inflector.....

EXTRACTION SYSTEM
Elecrostatic deflector . 3 sector.....

FACILITIES FOR RESEARCH
SHIELDED AREA, fixed ..... m^3 ; movable ..... m^3
TARGET STATIONS ..... In ..... rooms
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	60	–		
d	30	25	> 400	
α	60	52	50	
SECONDARY				(part/s)

BEAM PROPERTIES

MEASURED		CONDITIONS
PULSE WIDTH	35 . RF deg	pμ A of 25 . MeV . d 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)	{ 12 axial / 15 rad }	pμA of ..... MeV pd. Ions

OPERATING PROGRAMS, time distribution
BASIC NUCLEAR PHYSICS .. SOLID STATES PHYSICS ....
BIOMEDICAL APPLICAT. .... ISOTOPE PRODUCTIONS ....
.....
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REFERENCES/NOTES
1) International seminar on isochronous Cyclotron technique
Poland Krakow J.N.PH. 13 ÷ 18 Nov. 1978
report JFJ No. 1069/PL

PLAN VIEW OF FACILITY, NOTEWORTHY FEATURES, COMMENTS

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