

ENTRY No. 49

NAME OF MACHINE AIC-144 DATE 30.07.81
INSTITUTION INSTITUT OF NUCLEAR PHYSICS
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IN CHARGE J. SCHWABE REPORTED BY J. SCHWABE

HISTORY AND STATUS

DESIGN, date 1976 Model tests 1977-1979
ENG DESIGN, date 1977-78
CONSTRUCTION, date 1978-80-82
FIRST BEAM, date (or goal) 1983
MAJOR ALTERATIONS
MODIFICATION OF THE CLASSICAL CYCLOTRON U-120
COST, ACCELERATOR 60 MIL ZT
COST, FACILITY, total 15 MIL ZT

FUNDED BY
ACCELERATOR STAFF, OPERATION AND DEVELOPMENT
SCIENTISTS 7 ENGINEERS 9
TECHNICIANS 6 CRAFTS 5
GRAD STUDENTS involved during year 4
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 cm
R injection 1.2-2 cm
GAP, min 11.2 cm, Field 20.6 kG
max 22 cm, Field 17 kG } at 470,400
AVERAGE FIELD at R ext 17.5 kG } Ampere turns
B max/ <B> EXTRACTION 1.18
NUMBER OF SECTORS { compact 4 } Spiral, max 55 deg
{ separated 4 }
SECTOR ANGLE (SSC) 45 deg

TRIMMING COILS CIRCULAR 20
VALLEY 8
CONDUCTOR, material and type CU
STORED ENERGY (cryogenic) MJ
POWER: main coils 200 max, kW; current stability 10^-4
trimming coils 120 max, kW; current stability 5x10^-5
WEIGHT: Fe 10 tons; coils
COOLING system DISTIL H2O
ION ENERGY (bending limit) E/A = .56 q^2/a^2 MeV/amu
(focusing limit) E/A = .62 q/a MeV/amu

ACCELERATION SYSTEM
DEES, number 1; angle 180 deg
BEAM APERTURE 16 cm; DC Bias 12 kV
TUNED by coarse PANELS fine TRIMMERS
RF 8 to 26.8 MHz, stable +/- 10^-8
Orb F 6.65 to 26.6 MHz
HARMONICS, RF/Orb F, used 13
DEE - Gnd, max 50 kV, min gap 3 cm
STABILITY, (pk-pk noise)/(pk RF volt) 10^-4
ENERGY GAIN, max 100 kV/turn
RF PHASE, stable to +/- 1-1.5 deg
RF POWER input, max 150 kW
FREQUENCY MODULATION, rate /s
modulator, type
beam pulse, width +/- 10°, +/- 25° - 45°

VACUUM SYSTEM
OPERATING PRESSURE 2 x 10^-6 Torr or mbar
PUMPS, No Type, Size
TWO, DIFFUSION WITH NITROGEN COOLING

ION SOURCES
PENNING OR EXTERNAL SOURCES
i.e. TYPE: MAFIOS

INJECTION SYSTEM
INTERNAL HORIZONTAL AND AXIAL EXTERNAL
EXTRACTION SYSTEM
EXPANDER, ELECTRO-STATIC DEFLECTOR, COMPENSATOR
FACILITIES FOR RESEARCH
SHIELDED AREA, fixed 248 m^2; movable m^2
TARGET STATIONS 8 in 2 rooms
STATIONS served at same time, max 2
MAG SPECTROGRAPH, type
COMPUTER model PDP 11 SM3
OTHER FACILITIES ENERGY MONOCHROMATIZATION
EQUIPMENT

CHARACTERISTIC BEAMS

Table with columns: PARTICLE, ENERGY (MeV) Goal, Achieved, CURRENT (pA) Internal, External. Rows for P, d, O+4, 16, 20-60.

BEAM PROPERTIES

Table with columns: MEASURED, CONDITIONS. Rows for PULSE WIDTH, PHASE EXC, EXTRACT eff, RESOL, EMITTANCE.

OPERATING PROGRAMS, time distribution
BASIC NUCLEAR PHYSICS 50% SOLID STATES PHYSICS
BIOMEDICAL APPLICAT ISOTOPE PRODUCTIONS 15
APPLICATION FOR THE ONCOLOGY

REFERENCES/NOTES
INTERNATIONAL SEMINAR ON ISOCRONOUS
CYCLOTRON TECHNIQUE
RAPORT No 1069/PL CRACOW 1978 13-18 NOV.
PLAN VIEW OF FACILITY, NOTEWORTHY FEATURES,
COMMENTS

