

ENTRY No. 4

NAME OF MACHINE CYCLONE
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IN CHARGE G. RYCKEWAERT REPORTED BY G. RYCKEWAERT

HISTORY AND STATUS

DESIGN, date 1969 Model tests 1969
ENG DESIGN, date 1968-1969
CONSTRUCTION, date 1969-1971
FIRST BEAM, date (or goal) 1972
MAJOR ALTERATIONS

COST, ACCELERATOR 3.10.6 \$ U.S.
COST, FACILITY, total 6.5.106 \$ U.S.
FUNDED BY University of Louvain; IISN (State)

ACCELERATOR STAFF, OPERATION AND DEVELOPMENT
SCIENTISTS 3 ENGINEERS 3
TECHNICIANS 9 CRAFTS

GRAD STUDENTS involved during year
OPERATED BY Research staff or 5 Operators
OPERATION 1.68 hr/wk, On target 1.40 hr/wk
TIME DISTR. in house % Outside %
BUDGET, op & dev 800.000 \$ includ. salaries
FUNDED BY IISN - UCL

RESEARCH STAFF, not included above
USERS, in house 30 outside 45
GRAD STUDENTS involved during year 10
RESEARCH BUDGET, in house 600.000 \$ without salaries
FUNDED BY IISN - UCL

MAGNET
POLE FACE, diameter (compact) 215 cm, R extraction 93 cm
R injection cm
GAP, min 16.5 cm, Field 21.5 kG
max 40.5 cm, Field 11.5 kG at 4.106
AVERAGE FIELD at R ext 1.6 kG Ampere turns
B max/ <B>

NUMBER OF SECTORS {compact 4} Spiral, max 53 deg
{separated}
SECTOR ANGLE (SSC) deg
TRIMMING COILS 12 pairs

CONDUCTOR, material and type CU (20 x 20 phi 13 mm)
STORED ENERGY (cryogenic) MJ
POWER: main coils 400 max, kW; current stability 10^-5
trimming coils 100 max, kW; current stability 10^-3

WEIGHT: Fe 200 tons; coils 6 tons
COOLING system deionized water
ION ENERGY (bending limit) E/A = 130 q^2/a^2 MeV/amu
(focusing limit) E/A = 95 q^2/a^2 MeV/amu

ACCELERATION SYSTEM
DEES, number 2; angle 86 deg
BEAM APERTURE 3.8 cm; DC Bias 0 kV
TUNED by, coarse MP fine MP auto
RF 10.6 to 23 MHz, stable +/- 0.1 10^-6
Orb F 1.8 to 2.3 MHz
HARMONICS, RF/Orb F, used 1, 2, 3, 6
DEE - Gnd, max 50 kV, min gap cm
STABILITY, (pk-pk noise)/(pk RF volt) 10^-4
ENERGY GAIN, max 200 kV/turn
RF PHASE, stable to +/- 0.1 deg
RF POWER input, max 200 kW
FREQUENCY MODULATION, rate /s
modulator, type
beam pulse, width

VACUUM SYSTEM
OPERATING PRESSURE 2 x 10^-6 Torr or mbar
PUMPS, No, Type, Size 2 x OIL DIF 12,000 l/s
2 x CRYOPUMPS 3600 l/s

ION SOURCES
Internal: Livingston-Jones
External: ECR - OCTOPUS

INJECTION SYSTEM

Axial injection
EXTRACTION SYSTEM
DC electrostatic + weak magn. channel

FACILITIES FOR RESEARCH
SHIELDED AREA, fixed 390 m^2; movable 1300 m^2
TARGET STATIONS 14 in 10 rooms
STATIONS served at same time, max 1

MAG SPECTROGRAPH, type
COMPUTER model

OTHER FACILITIES Remote target handling, hot cell, neutron beam
(radiotherapy biology), on line mass separator (LISOL) - radioactive
ion beams

CHARACTERISTIC BEAMS

Table with columns: PARTICLE, ENERGY (MeV) Goal, Achieved, CURRENT (pA) Internal, External. Rows include p, alpha, Heavy ions, Ar.

SECONDARY
p. from Cp + Be at 65 MeV 10^14 (part/s)

BEAM PROPERTIES

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

(pi mm. mrad) {40 axial} .1 pA of 65 MeV p. ions
{60 rad}
OPERATING PROGRAMS, time distribution

BASIC NUCLEAR PHYSICS 50 SOLID STATES PHYSICS
BIOMEDICAL APPLICAT. 25 ISOTOPE PRODUCTIONS 10

REFERENCES/NOTES

PLAN VIEW OF FACILITY, NOTEWORTHY FEATURES, COMMENTS

