

ENTRY No. 23

NAME OF MACHINE ORLEANS ISOCHRONOUS CYCLOTRON DATE APRIL 1989
INSTITUTION CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE
ADDRESS C. E. R. A. 3A RUE DE LA FEROLLERIE 45045 ORLEANS CEDEX
TEL TELEX
IN CHARGE G. GOIN REPORTED BY G. GOIN

HISTORY AND STATUS

DESIGN, date 1971 Model tests 1971
ENG DESIGN, date 1971
CONSTRUCTION, date 1972-1973
FIRST BEAM, date (or goal) 1974
MAJOR ALTERATIONS

COST, ACCELERATOR 9 x 10^6 FF (1970)
COST, FACILITY, total 8.5 x 10^6 FF (1974) + 8 x 10^6 FF (1981)
FUNDED BY C.N.R.S.

ACCELERATOR STAFF, OPERATION AND DEVELOPMENT

SCIENTISTS ENGINEERS 3
TECHNICIANS 4 CRAFTS
GRAD STUDENTS involved during year
OPERATED BY Research staff or 6 Operators
OPERATION 64 hr/wk, On target 46 hr/wk
TIME DISTR. in house % Outside %
BUDGET, op & dev 1.35 x 10^6 FF (1981)
FUNDED BY CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE

RESEARCH STAFF, not included above
USERS, in house 10 outside 6
GRAD STUDENTS involved during year
RESEARCH BUDGET, in house
FUNDED BY

MAGNET

POLE FACE, diameter (compact) 160 cm, R extraction 67.5 cm
R injection cm
GAP, min 13 cm, Field 19 kG
max 27 cm, Field 11 kG } at 0.25 x 10^6
AVERAGE FIELD at R ext 15 kG } Ampere turns
B max / < B > 1, 27

NUMBER OF SECTORS { compact 4 } Spiral, max 53 deg
{ separated 4 }

SECTOR ANGLE (SSC) deg
TRIMMING COILS HARMONIC COILS 4
CIRC. COILS 8

CONDUCTOR, material and type
STORED ENERGY (cryogenic) MJ
POWER: main coils 110 max, kW; current stability 2.10^-5
trimming coils max, kW; current stability 2.10^-5

WEIGHT: Fe 100 tons; coils tons
COOLING system DEMINERALISED WATER
ION ENERGY (bending limit) E/A = .50 q^2/a^2 MeV/amu
(focusing limit) E/A = .50 q^2/a^2 MeV/amu

ACCELERATION SYSTEM

DEES, number 2; angle 60 deg
BEAM APERTURE 3 cm; DC Bias kV
TUNED by, coarse M-PANEL fine M-PANEL
RF 20 to 40 MHz, stable +/- 1/10^6
Orb F 5 to 20 MHz
HARMONICS, RF/Orb F, used
DEE - Gnd, max 40 kV, min gap cm
STABILITY, (pk-pk noise)/(pk RF volt) 5, 10^-3
ENERGY GAIN, max 132 kV/turn
RF PHASE, stable to +/- 0, 2 deg
RF POWER input, max 110 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 DIFFUSION PUMPS
2 x 6000 L / s

ION SOURCES

INTERNAL LIVINGSTONE TYPE

INJECTION SYSTEM

EXTRACTION SYSTEM

ELECTROSTATIC DEFLECTOR+FOCUSING MAGNET

FACILITIES FOR RESEARCH

SHIELDED AREA, fixed 25 m^2; movable 225 m^2
TARGET STATIONS 4 in 4 rooms
STATIONS served at same time, max 1
MAG SPECTROGRAPH, type
COMPUTER model
OTHER FACILITIES-FAST NEUTRON PRODUCTION FOR NEUTRON THERAPY, BIOLOGY and ACTIVATION - SHORT LIVED GAS ISOTOPE PRODUCTION-ISOTOPE PRODUCTION - CHEMISTRY FACILITY WITH HOT CELLS

CHARACTERISTIC BEAMS

Table with columns: PARTICLE, ENERGY (MeV), CURRENT (pA), Internal, External. Rows include P, d, ALPHA.

SECONDARY (part/s)
n, FROM P+Be FOR 10x10cm FIELD SIZE AT 1.35 cm SSD / .34 MeV DOSE RATE: 17 CGY/min

BEAM PROPERTIES

MEASURED CONDITIONS
PULSE WIDTH 25-30 RF deg 5 pA of 25 MeV d ions
PHASE EXC, max RF deg pA of MeV ions
EXTRACT eff 65% 40 pA of 34 MeV p ions
RESOL Delta E/E % pA of MeV ions
EMITTANCE
(pi mm. mrad) { axial } .3 pA of 45 MeV alpha ions
{ 40 rad }

OPERATING PROGRAMS, time distribution
BASIC NUCLEAR PHYSICS 0% SOLID STATES PHYSICS 69%
BIOMEDICAL APPLICAT. 31% ISOTOPE PRODUCTIONS 0%

REFERENCES/NOTES

PLAN VIEW OF FACILITY, NOTEWORTHY FEATURES, COMMENTS

