ENTRY No. FM-2

NAME OF MACHINE Synchro-Cyclotron Lyon ..... DATE ..... 3 avril 1989

INSTITUTION ..... Service Commun du Synchro-Cyclotron

ADDRESS ..... Université Claude Bernard Lyon-1 - 43, Bd du 11 Novembre 1918 - 69622 Villeurbanne Cedex (France)

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IN CHARGE Prof. B.E. Labnesche .. REPORTED BY G. HADINGER

HISTORY AND STATUS

DESIGN, date ..... Model tests .....
ENG DESIGN, date ..... 1956 .....
CONSTRUCTION, date ..... 1962 .....
FIRST BEAM, date (or goal) .. 1963 .....
MAJOR ALTERATIONS ... 1965 .....
.....
COST, ACCELERATOR .... 2,7 MF .....
COST, FACILITY, total .... 7,5 MF .....
FUNDED BY Ministère de l'Education Nationale .....

ACCELERATOR STAFF, OPERATION AND DEVELOPMENT

SCIENTISTS ... 1 ..... ENGINEERS .. 1 .....
TECHNICIANS ..... 1 ... CRAFTS .....
GRAD STUDENTS involved during year .....
OPERATED BY ..... Research staff or .... 1 ..... 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) 180. cm, R extraction . 7.5 cm
R injection ..... cm
GAP, min ... 35 ... cm, Field ... 14.7 ..... kG
max ... 35 .... cm, Field ... 14.7 ..... kG } at .. 0.61.10^6 Ampere turns
AVERAGE FIELD at R ext ..... kG
B max/ <B> .....
NUMBER OF SECTORS { compact ..... / separated ..... } Spiral, max .. deg
SECTOR ANGLE (SSC) ..... deg
TRIMMING COILS .....
.....
CONDUCTOR, material and type ..... Aluminium .....
STORED ENERGY (cryogenic) ..... ~ 1 ..... MJ
POWER : main coils ..... max, kW ; current stability .....
trimming coils ..... max, kW ; current stability .....
WEIGHT : Fe .. ~ . 200 ..... tons ; coils ..... tons
COOLING system .....
ION ENERGY (bending limit) E/A = ... q^2/a^2 MeV/amu
(focusing limit) E/A = ... q^2/a^2 MeV/amu

ACCELERATION SYSTEM

DEES, number ..... 2 ..... ; angle . 180 ..... deg
BEAM APERTURE ... 18.5 ... cm ; DC Bias .... 0.2 ..... kV
TUNED by, coarse ..... fine .....
RF ... 10.4 ..... to ..... 11.0. mHz, stable ± .....
Orb F ..... to ..... mHz
HARMONICS, RF/Orb F, used .....
DEE - Gnd, max .. 22. kV, min gap ..... cm
STABILITY, (pk-pk noise)/(pk RF volt) .....
ENERGY GAIN, max ..... kV/turn
RF PHASE, stable to ± ..... deg
RF POWER input, max .... 23 ..... kW
FREQUENCY MODULATION, rate ..... /s
modulator, type ..... Rotating capacitor .....
beam pulse, width .... 40 µsec macrocycle .....

VACUUM SYSTEM

OPERATING PRESSURE ..... 8×10^{-6} ..... Torr or mbar
PUMPS, No, Type, Size .. 1 Diffusion pump .....
50cm diamètre .....
.....

ION SOURCES

OPEN ION SOURCE .....

INJECTION SYSTEM

.....

EXTRACTION SYSTEM

Magnetic regenerative .....

FACILITIES FOR RESEARCH

SHIELDED AREA, fixed ..... 160. .. m^2 ; movable ..... m^2
TARGET STATIONS ..... 2 .. In ... 2 ..... 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
.. d	.....	.... 28	.... 30	.... 1.5 .....
.. alpha ...	.....	.... 56	.... 10	.....
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....
SECONDARY				(part/s)
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....

BEAM PROPERTIES

MEASURED		CONDITIONS
PULSE WIDTH	RF deg	pµ A of .... MeV ... ions
PHASE EXC, max ...	RF deg	pµ A of .... MeV ... ions
EXTRACT eff	%	pµ A of .... MeV ... ions
RESOL ΔE/E . 2-3.5 .	%	pµ A of .... MeV ... ions
EMITTANCE		
(π mm. mrad) { 40. axial / 40. . rad }		..... pµA of ..... MeV ... ions

OPERATING PROGRAMS, time distribution

BASIC NUCLEAR PHYSICS .. SOLID STATES PHYSICS ....
BIOMEDICAL APPLICAT. . 70% ISOTOPE PRODUCTIONS 30%
.....
.....

REFERENCES/NOTES

PLAN VIEW OF FACILITY, NOTEWORTHY FEATURES, COMMENTS