

ENTRY No. FM-3

NAME OF MACHINE SYNCHROCYCLOTRON LYON DATE 6/7/1981
 INSTITUTION SERVICE COMMUN. DU SYNCHROCYCLOTRON
 ADDRESS UNIVERSITE CLAUDE BERNARD LYON-1 / 43, BD DU 11 NOVEMBRE / 69622 VILLEURBANNE CEDEX
 TEL (7) 889.01.24 TELEX IPNLYON 380273F (FRANCE)
 IN CHARGE PROF. B.E. LAHNECHE 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 MINISTRE DE L'EDUCATION NATIONALE

ACCELERATOR STAFF, OPERATION AND DEVELOPMENT

SCIENTISTS 1 ENGINEERS 1
 TECHNICIANS 2 CRAFTS
 GRAD STUDENTS involved during year
 OPERATED BY Research staff or 2 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 X 10⁶
 AVERAGE FIELD at R ext kG } Ampere turns
 B max/

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

CONDUCTOR, material and type ALUMINUM
 STORED ENERGY (cryogenic) MJ
 POWER: main coils max, kW; current stability
 trimming coils max, kW; current stability
 WEIGHT: Fe 2.00 tons; coils tons
 COOLING system

ION ENERGY (bending limit) E/A = q²/a² MeV/amu
 (focusing limit) E/A = q/a MeV/amu

ACCELERATION SYSTEM

DEES, number 2; angle 180 deg
 BEAM APERTURE 1.8 x 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 2000 /s
 modulator, type ROTATING CAPACITOR
 beam pulse, width 40 μSEC, MACROCYCLE

VACUUM SYSTEM

OPERATING PRESSURE 8 X 10⁻⁶ Torr or mbar
 PUMPS, No, Type, Size 1 DIFFUSION PUMP
 50 CM DIAMETRE

ION SOURCES

OPEN ION SOURCE

INJECTION SYSTEM**EXTRACTION SYSTEM**

MAGNETIC REGENERATIVE

FACILITIES FOR RESEARCH

SHIELDED AREA, fixed 160 m²; movable m²
 TARGET STATIONS 6 in 2 rooms
 STATIONS served at same time, max
 MAG SPECTROGRAPH, type
 COMPUTER model
 OTHER FACILITIES

CHARACTERISTIC BEAMS

PARTICLE	ENERGY (MeV)		CURRENT (pμA)	
	Goal	Achieved	Internal	External
d	28		30	1.5
α	56		10	

SECONDARY (part/s)

BEAM PROPERTIES

MEASURED	CONDITIONS	
	RF deg	μA of MeV ions
PULSE WIDTH		
PHASE EXC, max		
EXTRACT eff	%	μA of MeV ions
RESOL ΔE/E 2-2.5 %		μA of MeV ions
EMITTANCE		

(π mm. mrad) { 40 axial }
 { 40 rad } pμA of MeV ions

OPERATING PROGRAMS, time distribution ~ 30 HOURS PER WEEK

BASIC NUCLEAR PHYSICS SOLID STATES PHYSICS 10 %
 BIOMEDICAL APPLICAT. 60 % ISOTOPE PRODUCTIONS 30 %

REFERENCES/NOTES**PLAN VIEW OF FACILITY, NOTEWORTHY FEATURES, COMMENTS**