

ENTRY NO. 21
 NAME OF MACHINE ALICE DATE : 25 mars 1984
 INSTITUTION INSTITUT DE PHYSIQUE NUCLEAIRE
 ADDRESS B.P. n° 1 ORSAY FRANCE
 TEL 941.73.04 TELEX
 IN CHARGE RICHOMME REPORTED BY RICHOMME

HISTORY AND STATUS

DESIGN, date 1959 Model tests 1958-59
 ENG DESIGN, date 1959-62
 CONSTRUCTION, date 1960-64
 FIRST BEAM, date (or goal) 1965 April
 MAJOR ALTERATIONS Linear injector 1968
 New Reams Area 1972
 COST, ACCELERATOR 5.10⁶ E
 COST, FACILITY, total 12.10⁶ E
 FUNDED BY Ministère de la Recherche Scientifique
ACCELERATOR STAFF, OPERATION AND DEVELOPMENT
 SCIENTISTS 0 ENGINEERS 1
 TECHNICIANS 17 CRAFTS 7
 GRAD STUDENTS involved during year
 OPERATED BY Research staff or 8 Operators
 OPERATION 120 hr/wk. On target 100 hr/wk
 TIME DISTR. in house .49 % Outside .51 %
 BUDGET, op & dev 0.9.10⁶ F
 FUNDED BY IN2P3
RESEARCH STAFF, not included above
 USERS, in house 38 outside 61
 GRAD STUDENTS involved during year
 RESEARCH BUDGET, in house 0.7.10⁶ F
 FUNDED BY CNRS IN2P3

MAGNET

POLE FACE, diameter (compact) cm, R extraction 80 cm
 R injection 30 cm
 GAP, min 21 cm, Field 18 kG }
 min 47 cm, Field 12.4 kG } at 0.75.10⁶
 AVERAGE FIELD at R ext 15 kG } Ampere turns
 B max/ < B > 1.2
 NUMBER OF SECTORS { compact 3 } Spiral, max deg
 { separated }
 SECTOR ANGLE (SSC) 50 deg
 TRIMMING COILS 3
 CONDUCTOR, material and type Aluminium
 STORED ENERGY (cryogenic) MJ
 POWER: main coils 490 max, kW; current stability 5.10⁻⁵
 trimming coils 72 max, kW; current stability 5.10⁻⁵
 WEIGHT: Fe 260 tons; coils 20 tons
 COOLING system oil and demineralized water
 ION ENERGY (bending limit) E/A = 75 q²/a² MEV/amu
 (focusing limit) E/A = q/a MeV/amu

ACCELERATION SYSTEM

DEES, number 1; angle 180 deg
 BEAM APERTURE 5 cm; DC Bias 0 kV
 TUNED by, coarse fine TRIM CAP
 RF 5 to 10.2 MHz, stable ± 7.10⁻⁶
 Orb F to MHz
 HARMONICS, RF/Orb F, used 1-3
 DEE-Gnd, max 75 kV, min gap cm
 STABILITY, (pk-pk noise)/(pk RF volt) 0.01
 ENERGY GAIN, max 150 kV/turn
 RF PHASE, stable to ± deg
 RF POWER input, max 100 kW
 FREQUENCY MODULATION, rate /s
 modulator, type
 beam pulse, width

VACUUM SYSTEM

OPERATING PRESSURE LINAC 5.10⁻⁷ 2EV. 10⁻⁶ Torr or mbar
 PUMPS, No, Type, Size 4 diffusion pumps one 80 cm
 three 60 cm TURBO-MOLECULAR PUMPS

ION SOURCES

Internal penning and Linac with internal stripping
 in the cyclotron

INJECTION SYSTEM

Internal stripping in the cyclotron

EXTRACTION SYSTEM

Electrostatic deflector + 2 magnetic channel

FACILITIES FOR RESEARCH

SHIELDED AREA, fixed 290 m²; movable m²
 TARGET STATIONS 9 in 2
 STATIONS served at same time, max 1
 MAG SPECTROGRAPH, type 120° n.a. 1/2
 COMPUTER model IBM 360-70
 OTHER FACILITIES PDP 11/05 and 11/34

CHARACTERISTIC BEAMS

PARTICLE	ENERGY (MeV)		CURRENT (µA)	
	Goal	Achieved	Internal	External
14 N ⁷⁺		210		50 nA
40 N ¹⁸⁺		400		100 nA
63 Zn ²⁰⁺		450		80 nA
109 Ag ²⁹⁺		550		3 nA
SECONDARY		131 (part/s)		
SINGLE LINEAR		X ₁₀ ⁻¹⁰	200 nA	

BEAM PROPERTIES

	MEASURED		CONDITIONS	
PULSE WIDTH 11 RF deg	1 µA	of	MeV	ions
PHASE EXC. max RF deg	µA	of	MeV	ions
EXTRACT eff 45%	µA	of	MeV	ions
RESOL ΔE/E 1%	µA	of	MeV	ions
EMITTANCE (π mm. mrad) { .42 axial } { 120 rad } Cyclo	µA	of	MeV	

OPERATING PROGRAMS, time distribution

BASIC NUCLEAR PHYSICS 64 SOLID STATES PHYSICS
 BIOMEDICAL APPLICAT 3 ISOTOPE PRODUCTIONS
 Various 23
 Developpement 10

REFERENCES/NOTES

- 1) Time is assigned program committee
- 2)

PLAN VIEW OF FACILITY, COMMENTS, ETC