ENTRY No. 21

NAME OF MACHINE ALICE DATE 06/07/1981
INSTITUTION Institut de Physique Nucléaire
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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 Beams Area 1972
COST, ACCELERATOR 5.10^6 F
COST, FACILITY, total 12.10^6 F
FUNDED BY Ministère de la Recherche Scientifique

ACCELERATOR STAFF, OPERATION AND DEVELOPMENT

SCIENTISTS 0 ENGINEERS 1
TECHNICIANS 24 CRAFTS 7
GRAD STUDENTS involved during year
OPERATED BY Research staff or 9 Operators
OPERATION 120 hr/wk, On target 100 hr/wk
TIME DISTR. in house 49 %, Outside 51 %
BUDGET, op & dev $0.9\ 10^6$ F
FUNDED BY IN2P3

RESEARCH STAFF, not included above

USERS, in house 38 outside 61
GRAD STUDENTS involved during year
RESEARCH BUDGET, in house $0.9\ 10^6$ 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
max 47 cm, Field 12.4 kG
AVERAGE FIELD at R ext 15 kG
at $0.75.10^6$ Ampere turns
B max/ <B> 1.2
NUMBER OF SECTORS compact 3 / separated — Spiral, max deg
SECTOR ANGLE (SSC) 50 deg
TRIMMING COILS
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 q^2/a^2 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} CEV 10^{-6} Torr or mbar
PUMPS, No, Type, Size 4 diffusion pumps one 80 cm three 60 cm

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 channels

FACILITIES FOR RESEARCH

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

CHARACTERISTIC BEAMS

PARTICLE	ENERGY (MeV) Goal	Achieved	CURRENT (pμA) Internal	External
$^{14}N^{7}$		210	50 nA	
$^{40}Ca^{15}$		400	100 nA	
$^{63}Cu^{20}$		450	80 nA	
$^{84}Kr^{25}$		520	5 nA	
SECONDARY				(part/s)

BEAM PROPERTIES

MEASURED	CONDITIONS
PULSE WIDTH 11 RF deg	1 pμ A of MeV ions
PHASE EXC, max RF deg	pμ A of MeV ions
EXTRACT eff 40 %	pμ A of MeV ions
RESOL ΔE/E 1 %	pμ A of MeV ions
EMITTANCE	
(π mm. mrad) $_{cyclo}$ {42. axial / 120. rad}	pμA of MeV ions

OPERATING PROGRAMS, time distribution

BASIC NUCLEAR PHYSICS 77 SOLID STATES PHYSICS
BIOMEDICAL APPLICAT. ISOTOPE PRODUCTIONS
various 13
developpement 10

REFERENCES/NOTES

Time is assigned by program committee

PLAN VIEW OF FACILITY, NOTEWORTHY FEATURES, COMMENTS