ENTRY No. 20

NAME OF MACHINE GANIL DATE May 1989
INSTITUTION GANIL
ADDRESS BP 5027 - 14021 CAEN Cedex FRANCE
TEL 31.45.46.47 TELEX 170533 F
IN CHARGE A. JOUBERT REPORTED BY GANIL STAFF

HISTORY AND STATUS

DESIGN, date 1973 Model tests 1976
ENG DESIGN, date 1975-76
CONSTRUCTION, date 1976-1982
FIRST BEAM, date (or goal) Nov. 1982
MAJOR ALTERATIONS Upgrading heavy ions energy limits (OAE project 1989)
COST, ACCELERATOR 400 MEF (1986)
COST, FACILITY, total 750 MEF (1986)
FUNDED BY CEA and IN2P3 (CNRS)

ACCELERATOR STAFF, OPERATION AND DEVELOPMENT

SCIENTISTS - ENGINEERS 26
TECHNICIANS 66 CRAFTS -
GRAD STUDENTS involved during year -
OPERATED BY 9 Research staff or 18 Operators
OPERATION 146 hr/wk, On target 100 hr/wk
TIME DISTR. in house ~70 %, Outside ~30 %
BUDGET, op & dev 50 millions FF
FUNDED BY CEA and IN2P3 (CNRS)

RESEARCH STAFF, not included above

USERS, In house 15 outside 400
GRAD STUDENTS involved during year
RESEARCH BUDGET, In house
FUNDED BY CEA and CNRS

MAGNET

POLE FACE, diameter (compact) - cm, R extraction 300 cm
R injection 314 cm (SSC1) and 1.2 m (SSC2 after June 89)
GAP, min 10 cm, Field 16.5 kG
max - cm, Field - kG
at 173000 Ampere turns
AVERAGE FIELD at R ext 9.5 kG
B max/ <B> 1.73
NUMBER OF SECTORS { compact - / separated 4 } Spiral, max 0. deg
SECTOR ANGLE (SSC) 52 deg
TRIMMING COILS 12 in series for isochronism and 28 independant
CONDUCTOR, material and type Copper + MgO
STORED ENERGY (cryogenic) MJ
POWER : main coils 950 max, kW ; current stability 10^{-5}
trimming coils 140 max, kW ; current stability 10^{-4}
WEIGHT : Fe 1700 tons ; coils 14 tons
COOLING system De-ionized water in closed loop
ION ENERGY (bending limit) E/A = 380 q^2/a^2 MeV/amu
(focusing limit) E/A = - q^2/a^2 MeV/amu

ACCELERATION SYSTEM

DEES, number 2 ; angle 34 deg
BEAM APERTURE 5 cm ; DC Bias - kV
TUNED by, coarse movable pannel fine rotating loop
RF 7 to 14 mHz, stable ± 10^{-8}
Orb F 3.5 to 7 mHz
HARMONICS, RF/Orb F, used 2(SSC2) - 5 (SSC1)
DEE - Gnd, max 200 kV, min gap 6 cm
STABILITY, (pk-pk noise)/(pk RF volt) 10^{-4}
ENERGY GAIN, max 4 * 200 kV/turn
RF PHASE, stable to ± 0.1 deg
RF POWER input, max 80/cavity kW
FREQUENCY MODULATION, rate 0 /s
modulator, type -
beam pulse, width -

VACUUM SYSTEM SSC1 or SSC2

OPERATING PRESSURE 5.10^{-8} Torr or mbar
PUMPS, No, Type, Size 4 turbo pumps 3500 l/sec
8 cryo 20000 l/sec

ION SOURCES

ECR exclusively

INJECTION SYSTEM SSC1 and SSC2

magnetic channel + electrostatic inflector

EXTRACTION SYSTEM

electrostatic deflector + magnetic channels

FACILITIES FOR RESEARCH

SHIELDED AREA, fixed - m² ; movable 4000 m²
TARGET STATIONS 10 In 8 rooms
STATIONS served at same time, max 2 in time sharing
MAG SPECTROGRAPH, type LISE. Energy loss spectrometer (SPEG)
COMPUTER model MODCOMP
OTHER FACILITIES Industrial applications - Dedicated atomic physics room

CHARACTERISTIC BEAMS

PARTICLE	ENERGY (MeV) (SSC2) Goal	Achieved	CURRENT (pμA) out of SSC2 Internal	External	
O	16.	1500		0.187	before OAE modifications
Ni	58.	3190		0.0022	
Kr	86.	3698		0.007	
Xe	129.	3483		0.0025	
SECONDARY			(part/s)		

Exotic beams in the LISE spectrometer

BEAM PROPERTIES

MEASURED		CONDITIONS; all beams
PULSE WIDTH 6	RF deg FWHM	pμ A of MeV ions
PHASE EXC, max	RF deg	pμ A of MeV ions
EXTRACT eff 80.	%	pμ A of MeV ions
RESOL ΔE/E 0.1	%	pμ A of MeV ions

EMITTANCE

(π mm. mrad) { ≤ .5 axial / ≤ .5 rad } pμA of MeV ions

OPERATING PROGRAMS, time distribution

BASIC NUCLEAR PHYSICS 80% SOLID STATES PHYSICS 10%
BIOMEDICAL APPLICAT. - ISOTOPE PRODUCTIONS -
INDUSTRIAL APPLICATIONS 10%

REFERENCES/NOTES

PLAN VIEW OF FACILITY, NOTEWORTHY FEATURES, COMMENTS