ENTRY NO. C13 **Date** 01/07/1992

Name of Machine GANIL SSC1 and SSC2 (Upgraded : OAE (1989) and OAI (1992) projects)

Institution GANIL

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In Charge: M. BAJARD Reported by: GANIL STAFF

HISTORY

MILESTONE DATES:

Design 1973-76 Model Tests 1976

Construction 1976-82 First Beam Nov. 82

DESIGN/CONSTRUCTION BY:

in house X other

COST: Accelerators 400 MF (86) Facility 750 MF (86)

FUNDED BY: CEA - CNRS

STATUS

STAFF: Machine and research

Scientists - Engineers 70

Technicians 117 Students -

Research (in house/external)

Scientists 18 / 400 Engineers - / -

Technicians / Students 10 / -

BUDGET: Machine } 50 MF (91) Funded by } CEA - CNRS

Research } Funded by }

TIME DISTRIBUTION: 5530 h (91) + 1500 h (SME 91)

Basic Research (in house/external) 66.5 % / %

Applied Program (in house/external) 3.5 % / %

Development 7.5 % Maintenance during shut-down %

Tunings : 22.5 %

MAGNET

POLE PARAMETERS:

Diameter cm $R_{extract}$ 300 cm R_{inject} SSC1:81.4 SSC2:120 cm

HILL PARAMETERS: Gap (min) 10 cm B_{max} 1.65 T

(@ 190000 AT) Gap (max) cm B_{min} 0.7 T

VALLEY PARAMETERS: Gap (min) cm B_{max} T

(@ AT) Gap (max) cm B_{min} T

AVERAGE FIELD: $< B >_{min}$ 0.39 T $< B >_{max}$ 0.95 T

NUMBER OF SECTORS: compact/separated / 4

sector angle 52 (straight) deg. spiral (max) deg.

FIELD TRIMMING: Trim Coils 12 in series for isochronism

Harmonic Coils

Other 28

CURRENT: Main Coils 950kW-1850 Amps Stability 10^{-5}

Trim Coils 140 kW Amps Stability 10^{-4}

Stored Energy (cryogenic) MJ

WEIGHT: Iron 1700 Tons Conductor 14 Tons

ION ENERGY: Bending Limit E/A = 380 q^2/A^2 MeV/u

Focussing Limit E/A = q/A MeV/u

ACCELERATION SYSTEM

FUNDAMENTAL ACCELERATION:

Description: 2x34° resonators, movable panel, rotating loop

No. of Gaps/turn 4 dE/dn(max) 0.8 MeV/q

Voltage(max) 0.250 MV Harmonic f_{rf}/f_{ion} SSC1:5-SSC2:2

Freq 7 - 14 MHz Power in(max) 0.1/resonator MW

Stability: Phase ± 0.1 ° Voltage 10^{-4}

OTHER CAVITIES (Flattopping or otherwise):

Description:

Region of Influence: R_{min} cm R_{max} cm

No. of Gaps/turn dE/dn(max) MeV/q

Voltage(max) MV Harmonic f_{rf}/f_{ion}

Freq MHz Power in(max) MW

Stability: Phase Voltage

VACUUM SYSTEM

OPERATING PRESSURE: 6.10^{-6} Pascal

PUMPS: No. and type 4 turbo : 3500 l/s

8 cryo : 20000 l/s

ION SOURCE(S)

	Type	Intensity (mA)	@	$\epsilon_n = \beta\gamma\epsilon$ (πmm mrad)	Ion Species
(a)	SSC1 injected by C01 or C02				
(b)	(see related entry)				
(c)	SSC2 injected by SSC1 after solid foil				Ne_{3+} - U_{238}
(d)	stripper (nominal stripping ratio : 2.5)				

INJECTION SYSTEM

electrostatic inflector and magnetic channel Efficiency 80-100 %

EXTRACTION SYSTEM

eleotrostatic deflector and magnetic channel Efficiency 80-100 %

CHARACTERISTIC BEAMS

Accelerated Ions	E/A (MeV/u)	Current(part μA) Internal	External
(a) SSC1-Ne^{+6}	15		$1.25.10^{13}$ pps
(b) U^{+24}	4		5.10^{10} pps
(c) SSC2-Ne^{+10}	95	limited to 400 W	$1.2.10^{12}$ pps
(d) U^{+58}	25		10^{9} pps

Secondary Particles	E (MeV)	part/sec
(a) RIB by fragmentation (SISSI upgrade project in progress)		
(b) Be_{11}	40 MeV/u	10^5
(c) O_{14}	70 MeV/u	4.10^5

EXTRACTED BEAM PROPERTIES: (maximum values full width)

For 10^9-10^{12} ppsμA of 25-95 MeV/u C - U ions

$\Delta E/E$ 0.1-0.4 % $\Delta\phi$ SSC1:8-10, SSC2:10-15 °rf

$\epsilon_n = \beta\gamma\epsilon$ x SSC1:7 SSC2:5 πmm mrad z SSC1:7 SSC2:5 πmm mrad

FACILITIES FOR RESEARCH

SHIELDED AREA: Fixed m² Moveable 4000 m²

Target Stations: 10 No. Served At Same Time: 2

MAGNETIC SPECTROMETERS: α, SPEG and LISE (RIB)

OTHER FACILITIES:

4π detectors (NAUTILUS-INDRA-ORION)

Industrial applications (dedicated)

Atomic-solid state physics on a spare Q after stripping (SME)

REFERENCES/NOTES

(a)

(b)

PLAN VIEW OF FACILITY, COMMENTS