

ENTRY NO. C14 Date October 1995
 Name of Machine SSC1 and SSC2 of GANIL
 Institution GANIL
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 In Charge: F. LOYER Reported by:

HISTORY

MILESTONE DATES:

Design 1973-76 Model Tests 1976
 Construction 1976-82 First Beam Nov. 1982
 DESIGN/CONSTRUCTION BY:
 in house other
 COST: Accelerator 400 MFF (1986) Facility 750 MFF (1983)
 FUNDED BY: CEA-CNRS

STATUS

STAFF: Machine (accelerator and experiment area)
 Scientists Engineers 70
 Technicians 120 Students
 Research (in house/external)
 Scientists 22 / 400 Engineers 1
 Technicians 1 Students 15
 BUDGET: Machine 50 MFF (1995) Funded by CEA-CNRS
 Research Funded by
 TIME DISTRIBUTION:
 Basic Research (in house/external) 72 % / %
 Applied Program (in house/external) 3 % / %
 Maintenance 3 months % Development 5 %
 Tuning 20 %

MAGNET

POLE PARAMETERS: SSC1 81.4 cm
 Diameter cm $R_{extract}$ 300 cm R_{inject} SSC2 120 cm
 HILL PARAMETERS: Gap (min) 10 cm B_{max} 1.65 T
 (@ 190,000 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: $\langle B \rangle_{min}$ 0.39 T $\langle B \rangle_{max}$ 0.95 T
 NUMBER OF SECTORS: compact/separated 1/4
 sector angle 52 deg. spiral (max) deg.
 FIELD TRIMMING: Trim Coils 12 for isochronism
 Harmonic Coils
 Other 28
 CURRENT: Main Coils 950 kW - 1850 A Amps Stability 10⁻⁴
 Trim Coils 140 kW (total) Amps Stability 10⁻⁴
 Stored Energy (cryogenic) MJ
 WEIGHT: Iron 1700 tons Conductor 14 tons
 ION ENERGY: Bending Limit E/A = 380 q²/A² MeV/u
 Focusing Limit E/A = q/A MeV/u

ION SOURCE(S)

Type	Intensity (mA)	@ $\epsilon_n = \beta \gamma \epsilon$ (mm mrad)	Ion Species
(a) SSC1... injected by CQ1 or CQ2 (see entry SSC)			
(b) SSC2... injected by SSC1 after a stripper			
(c) stripper ratio <u>1.2-5</u>			
(d)			

INJECTION SYSTEM

electrostatic inflector Efficiency 80 to 100 %
 and magnetic channel

EXTRACTION SYSTEM

electrostatic deflector Efficiency 80 to 100 %
 and magnetic channel

CHARACTERISTIC BEAMS

Accelerated Ions	E/A (MeV/u)	Current (part μ A)	
		Internal	External
(a) SSC1... Ne^{+6}	<u>15</u>	<u>1.25</u>	<u>10¹³ pps</u>
(b) U^{+24}	<u>4</u>	<u>5</u>	<u>10¹² pps</u>
(c) SSC2... Ne^{+10}	<u>95 (limited to 400 W)</u>	<u>1.2</u>	<u>10¹² pps</u>
(d) U^{+58}	<u>25</u>	<u>10</u>	<u>pps</u>

Secondary Particles	E (MeV)	part/sec
(a) by fragmentation in the SISSI target		
(b)		
(c)		

EXTRACTED BEAM PROPERTIES:

For μ A of 25 to 95 MeV/u C to U ions
 $\Delta E/E$ 0.1 to 0.4 % $\Delta \phi$ 10 to 15 °
 $\epsilon_n = \beta \gamma \epsilon$ x 7 (SSC1) π mm mrad z 7 (SSC1) π mm mrad
5 (SSC2)

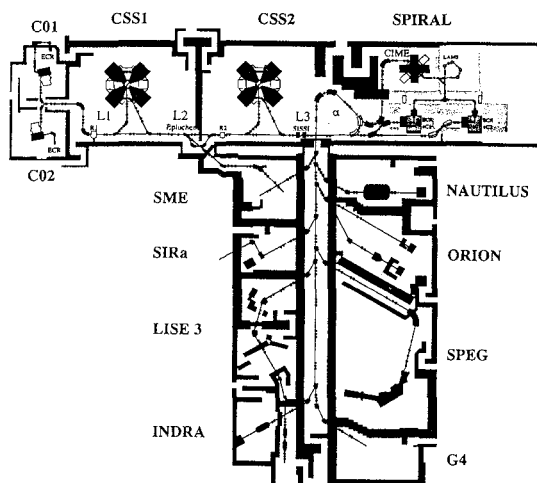
FACILITIES FOR RESEARCH

SHIELDED AREA: Fixed: m² Moveable 4000 m²
 Target Stations: 10 No. Served At Same Time: 2
 MAGNETIC SPECTROMETERS: α , SPEG and LISE
 OTHER FACILITIES:
40 detectors (NAUTILUS, INDRA, ORION)
industrial irradiations
medium energy output after stripping (SME)

REFERENCES/NOTES

(a)
 (b)

PLAN VIEW OF FACILITY, COMMENTS



ACCELERATION SYSTEM

FUNDAMENTAL ACCELERATION:

Description: 2 x 34° resonators, movable panels, rotating loop
 No. of Gaps/turn 4 dE/dn(max) 0.8 MeV/q
 Voltage (max) 0.250 MV Harmonic f_H/f_{ion} SSC1: 1.5, SSC2: 2
 Freq 7 to 14 MHz Power in(max) (resonator) 0.1 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_H/f_{ion}
 Freq MHz Power in(max) MW
 Stability: Phase Voltage

VACUUM SYSTEM

OPERATING PRESSURE: 6.10⁻⁶ Pa
 PUMPS: (No. and type) 4 turbo (3 500 l/s)
8 cryo (20 000 l/s)