

Entry: **C14**
 Machine Name: C01
 Address: BP 5027 14076 CAEN CEDEX 5 - FRANCE
 In Charge of the cyclotron: M.H.Moscatello (operation)
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HISTORY

Design by: in house
 Construction time: 1976-1980
 First beam: 1980

CHARACTERISTIC BEAMS

ions / energy (MeV/n) / current (pps) / power (W) :
 - ¹²C to ²³⁸U / 0.3 to 1 / 1 10¹⁴ (gas) / 1
 - / 1 10¹¹ to 1 10¹³ (metal) / << 1
 - (depend of the ion and of the SSC energy)

transmission efficiency (total)
 - typical: ... 50 % - best: 65 %
 transverse emittance (rms)
 - vertical: 40 π mmmrad
 - horizontal: 40 π mmmrad
 longitudinal emittance (rms) 10⁻² . 12 ΔE/E.deg RF

USES

SSC1 injector: 40 % basic research: 0 %
 development: 40 % maintenance: 5 %
 beam tuning (all cyclotrons): 15 %
 total time: 5000 h/year

TECHNICAL DATA

a) magnet
 type: room temperature
 Kb: 28 MeV/A Kf: 28 MeV/A
 average field (min-max): 1.0 - 1.565 T
 number of magnet sectors: 3
 - angle: deg
 - spiral (max): deg
 pole parameters
 - diameter: m
 - injection radius: 0.074 m
 - extraction radius: 0.488 m
 hill gap: 0.021 m valley gap: m
 field trimming
 - trim coils
 - number: 6
 - current (max): 500 A
 - harmonic coils
 - number:
 - current (max): A
 - others
 - number:
 - current (max): A
 main coils:
 - number: 2
 - Ampere-turns: A.T.
 - current: 1500 A
 stored energy: MJ
 weight : - iron: t - coils: t
 power
 - main coils (total): kW
 - trim coils (total max): kW
 - refrigerator (cryogenic): kW

b) RF

- acceleration
 - frequency range: 7 to 14 MHz
 - harmonic modes: 3
 - number of dees: 1
 - angular aperture: 180 deg
 - voltage:- average (min-max): 50-90 kV
 - variation with radius:
 - power in (max): 30 kW
 - stability: - phase: ±0.1 deg - voltage: ± 0.01 %

- other cavities
 - purpose:
 - frequency range: MHz
 - region of influence: m
 - voltage (max): kV
 - power in (max): kW
 - stability:- phase: deg - voltage: %

e) injection

- internal source: no
 - external (radial/axial): axial
 - elements: 1 electrostatic spiral inflector
 - source voltage: 90 kV
 - injection energy: MeV/n
 - rebuncher: harmonic 1 and 2
 - injection efficiency: up to 65 %
 d) ion sources/injector
 ECRIS (ECR4 - 14.5 GHz)

e) extraction

- elements, characteristics:
 - 1 electrostatic deflector with septum
 - 1 electrostatic quadrupole
 - efficiency
 - typical: 90 % - best: 100 %

f) vacuum

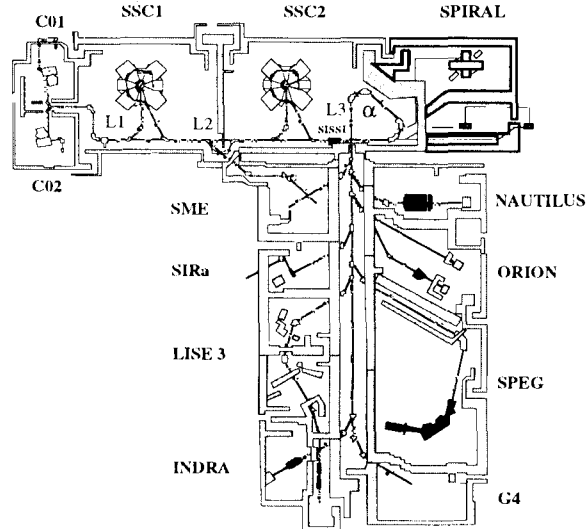
- pumps: 3 cryopumps (20000 l/s each)
 - achieved vacuum: 5 10⁻⁶ Pa

REFERENCES

EXPERIMENTAL FACILITIES

injector of SSC1

PLAN VIEW OF FACILITY



COMMENTS