

ENTRY NO. C15 Date September 1995
 Name of Machine SARA (Injector)
 Institution INSTITUT DES SCIENCES NUCLEAIRES
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HISTORY

MILESTONE DATES:
 Design 1962 Model Tests 1963
 Construction 1963-1967 First Beam 1968
 DESIGN/CONSTRUCTION BY:
 in house other C.S.F.
 COST: Accelerator $2 \cdot 10^6$ Facility $6 \cdot 10^6$
 FUNDED BY: IN2P3/CNRS

STATUS

STAFF: Machine
 Scientists 1 Engineers 8
 Technicians 19 Students
 Research (in house/external)
 Scientists 25 / 80 Engineers /
 Technicians / Students 5 / 10
 BUDGET: Machine $4 \cdot 10^5$ Funded by IN2P3/CNRS
 Research Funded by
 TIME DISTRIBUTION:
 Basic Research (in house/external) 40 % / 45 %
 Applied Program (in house/external) 10 % /
 Maintenance % Development 5 %

MAGNET

POLE PARAMETERS:
 Diameter 2.12 cm R_{extract} 88 cm R_{inject} 2 cm
 HILL PARAMETERS: Gap (min) 16 cm B_{max} 1.9 T
 (@ $360 \cdot 10^3$ AT) Gap (max) cm B_{min} T
 VALLEY PARAMETERS: Gap (min) 36 cm B_{max} 1.2 T
 (@ $360 \cdot 10^3$ AT) Gap (max) cm B_{min} T
 AVERAGE FIELD: $\langle B \rangle_{\text{min}}$ 1.6 T $\langle B \rangle_{\text{max}}$ 1.6 T
 NUMBER OF SECTORS: compact/separated 4 /
 sector angle deg. spiral (max) 40 deg.
 FIELD TRIMMING: Trim Coils 11
 Harmonic Coils 4
 Other
 CURRENT: Main Coils 1100 Amps Stability 10^{-5}
 Trim Coils 200 Amps Stability 10^{-4}
 Stored Energy (cryogenic) MJ
 WEIGHT: Iron 200 t Conductor Cu 13 x 18 mm
 ION ENERGY: Bending Limit E/A = 90 q²/A² MeV/u
 Focusing Limit E/A = q/A MeV/u

ACCELERATION SYSTEM

FUNDAMENTAL ACCELERATION:
 Description: 2 moving pannel resonators
 No. of Gaps/turn 4 dE/dn(max) MeV/q
 Voltage (max) 0.06 MV Harmonic f_r/f_{ion} (1) 2, 3
 Freq 10.5 to 16 MHz Power in(max) 0.03 MW
 Stability: Phase ± 0.1 Voltage $\pm 10^{-4}$
 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_r/f_{ion}
 Freq MHz Power in(max) MW
 Stability: Phase Voltage

VACUUM SYSTEM

OPERATING PRESSURE: 10^{-6}
 PUMPS: (No. and type) 2 NRC OIL Diffusion

ION SOURCE(S)

Type	Intensity (mA)	@ $\epsilon_n = \beta \gamma \epsilon$ (π mm mrad)	Ion Species
(a) CAPRICE 0.8 T		150	P to Xe
(b) CAPRICE 1 T		150	p. to Xe
(c)			
(d)			

INJECTION SYSTEM

18 m line + Belmont Inflector Efficiency 30 %

EXTRACTION SYSTEM

Electrostatic + Magnetic channels Efficiency 75 %

CHARACTERISTIC BEAMS

Accelerated Ions	E/A (MeV/u)	Current (e μ A)
(a) $^{18}\text{O}^{5+}$	10.5	6
(b) $^{40}\text{Ca}^{11+}$	5.5	1
(c) $^{40}\text{Ca}^{11+}$	6.4	1.5
(d) $^{64}\text{Ni}^{17+}$	5.9	1

Secondary Particles	E (MeV)	part/sec
(a)		
(b)		
(c)		

EXTRACTED BEAM PROPERTIES:

For 1 μ A of 5 MeV/u Neon⁶⁺ ions
 $\Delta E/E$ 0.4 % $\Delta \phi$ 10 °
 $\epsilon_n = \beta \gamma \epsilon$ x 15 π mm mrad z 17 π mm mrad

FACILITIES FOR RESEARCH

SHIELDED AREA: Fixed: 900 m² Moveable m²
 Target Stations: 7 No. Served At Same Time:
 MAGNETIC SPECTROMETERS:
 OTHER FACILITIES:
 Fast neutron irradiation facility
 10^9 n/cm²/s at 0°

REFERENCES/NOTES

- (a) Annales de radioélectrité TXXI April 1966 p. 121-150
 (b) S. Albrand et al., - Proceeding at the 13th Int. Conf. on Cyclotron p. 62-66

PLAN VIEW OF FACILITY, COMMENTS

See following entry

