ENTRY NO. C14 **Date** June 1992

Name of Machine SARA (Injector)

Institution INSTITUT DES SCIENCES NUCLEAIRES

Address 53, avenue des Martyrs 38026 GRENOBLE Cedex France

Tel (33)76.28.40.00 Telex 320301F Fax (33)76.28.40.04 EMAIL

In Charge: D. BARNEOUD, M. FRUNEAU Reported by: M. FRUNEAU

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 $2\ 10^6$ $ Facility 6.10^6 $

FUNDED BY: IN2P3/CNRS

STATUS

STAFF: Machine

Scientists 1 Engineers 9

Technicians 27 Students 1

Research (in house/external)

Scientists 40 / 50 Engineers 2 / .....

Technicians 8. / ..... Students 6 / .....

BUDGET: Machine 10^6 $ Funded by IN2P3/CNRS

Research $0.5\ 10^6$ $ Funded by IN2P3/CNRS

TIME DISTRIBUTION:

Basic Research (in house/external) 70 % / 30 %

Applied Program (in house/external) 2 % / 6 %

Development 6 % Maintenance 7 %

MAGNET

POLE PARAMETERS:

Diameter 212 cm $R_{extract}$ 88 cm R_{inject} 2. cm

HILL PARAMETERS: Gap (min) 16 cm B_{max} 1.9 T

(@ $360\ 10^3$ AT) Gap (max) ..... cm B_{min} ..... T

VALLEY PARAMETERS: Gap (min) 36 cm B_{max} 1.2 T

(@ $360\ 10^3$ AT) Gap (max) ..... cm B_{min} ..... T

AVERAGE FIELD: $< B >_{min}$ 1.6 T $< B >_{max}$ 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 q^2/A^2 MeV/u

Focussing 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_{rf}/f_{ion} (1), 2, 3

Freq 10.5 to 16. MHz Power in(max) 0.03 MW

Stability: Phase $\pm$ 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_{rf}/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)	@	$\epsilon_n = \beta\gamma\epsilon$ (πmm mrad)	Ion Species
(a)	MINIMAFIOS	.....		150	p to Kr
(b)	CAPRICE	.....		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(part μA) Internal	External
(a) $^{20}Ne^{6+}$	5.6	.....	2 euA
(b) $^{28}Si^{6+}$	3.8	.....	2 euA
(c) $^{40}Ca^{11+}$	6.6	.....	1.5euA
(d) $^{84}Kr^{18+}$	4.0	.....	0.1euA

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

EXTRACTED BEAM PROPERTIES:

For 1 μA of 5 MeV/u Néon^{6+} ions

$\Delta E/E$ 0.4 % $\Delta\phi$ 10 °rf

$\epsilon_n = \beta\gamma\epsilon$ x 15 πmm mrad z 17 πmm mrad

FACILITIES FOR RESEARCH

SHIELDED AREA: Fixed 900 m² Moveable ..... m²

Target Stations: 7 No. Served At Same Time: 1

MAGNETIC SPECTROMETERS: .....

OTHER FACILITIES: .....

REFERENCES/NOTES

(a) Annales de radioélectricité TXXI April 1966 p.121-150

(b) New developments at SARA, These proceedings.

PLAN VIEW OF FACILITY, COMMENTS

See following entry