ENTRY NO. C16 **Date** September 1995

Name of Machine SARA (Post-Accelerator)

Institution INSTITUT DES SCIENCES NUCLEAIRES

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

HISTORY

MILESTONE DATES:

Design 1976 Model Tests 1977

Construction 1978-1981 First Beam 1981

DESIGN/CONSTRUCTION BY:

in house other

COST: Accelerator $1.6\ 10^6$ Facility $.6\ 10^6$

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 Funded by IN2P3/CNRS

Research $4\ 10^5$ Funded by

TIME DISTRIBUTION:

Basic Research (in house/external) 40 % / 45 %

Applied Program (in house/external) 10 % / %

Maintenance % Development 5 %

MAGNET

POLE PARAMETERS:

Diameter 450 cm $R_{extract}$ 214 cm R_{inject} 90 cm

HILL PARAMETERS: Gap (min) 6 cm B_{max} 1.65 T

(@ AT) Gap (max) 6 cm B_{min} 1.65 T

VALLEY PARAMETERS: Gap (min) cm B_{max} 0 T

(@ AT) Gap (max) cm B_{min} 0 T

AVERAGE FIELD: $<B>_{min}$ 0.9 T $<B>_{max}$ 0.9 T

NUMBER OF SECTORS: compact/separated / 4

sector angle 48 deg. spiral (max) 0 deg.

FIELD TRIMMING: Trim Coils 15

Harmonic Coils 2

Other

CURRENT: Main Coils 900 Amps Stability $\pm\ 10^{-5}$

Trim Coils 200 Amps Stability 10^{-3}

Stored Energy (cryogenic) MJ

WEIGHT: Iron 400 t Conductor 14 x 14 mm

ION ENERGY: Bending Limit E/A = 160 q^2/A^2 MeV/u

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

ACCELERATION SYSTEM

FUNDAMENTAL ACCELERATION:

Description: Δ shaped dees moving pannels

No. of Gaps/turn 4 dE/dn(max) 0.2 MeV/q

Voltage (max) 0.05 MV Harmonic f_{rf}/f_{ion} 4.6

Freq 20-32 MHz Power in(max) 0.03 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: 10^{-6} mbar

PUMPS: (No. and type) Cryogenic

6X CTI CT320

ION SOURCE(S)

	Type	Intensity (mA)	@ $\varepsilon_n = \beta\gamma\varepsilon$ (π mm mrad)	Ion Species
(a)				
(b)	See preceeding entry			
(c)				
(d)				

INJECTION SYSTEM

3 magnet + 1 electrostic channels Efficiency 75 %

EXTRACTION SYSTEM

1 electrostatic + 1 electrostic channels Efficiency 75 %

CHARACTERISTIC BEAMS

Accelerated Ions	E/A (MeV/u)	Current (e μA) Internal	External
(a) $^{20}Ne^{10+}$	38		0.6
(b) $^{32}S^{15+}$	26		0.32
(c) $^{40}Ca^{18+}$	34		0.12
(d) $^{84}Kr^{26+}$	13		0.2

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

EXTRACTED BEAM PROPERTIES:

For 0.2 μA of 30 MeV/u $Neon^{10+}$ ions

ΔE/E 0.5 % Δφ 20 °rf

$\varepsilon_n = \beta\gamma\varepsilon$ x 20 π mm mrad z 10 π mm mrad

FACILITIES FOR RESEARCH

SHIELDED AREA: Fixed: 900 m^2 Moveable m^2

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

MAGNETIC SPECTROMETERS:

OTHER FACILITIES:

REFERENCES/NOTES

(a) IEEE/NS-30 N° 4 August 1983

(b)

PLAN VIEW OF FACILITY, COMMENTS

See Preceding entry