

ENTRY NO. C51 Date SEPTEMBER 21/95
 Name of Machine NAC Injector Cyclotron 1
 Institution National Accelerator Centre
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HISTORY

MILESTONE DATES:

Design 1978 Model Tests 1979 - 1980
 Construction 1978 - 1983 First Beam December 1983

DESIGN/CONSTRUCTION BY:

in house Yes other various engineering contractors

COST: Accelerator Facility

FUNDED BY:

ION SOURCE(S)

	Type	Intensity (mA)	@ $\epsilon_n = \beta\gamma\epsilon$ (π mm mrad)	Ion Species
(a)	PIG	4		P
(b)				
(c)				
(d)				

INJECTION SYSTEM

Efficiency %

EXTRACTION SYSTEM

Electrostatic & 2 magnetic channels Efficiency 96 %

CHARACTERISTIC BEAMS

	Accelerated Ions	E/A (MeV/u)	Current (part μ A)	
			Internal	External
(a)	P	1.4 - 8	414	323
(b)	d	0.9 - 1.9	6	3
(c)	$^3\text{He}^{++}$ and $^4\text{He}^{++}$	0.62 - 2.5	5	3
(d)				

Secondary Particles E (MeV) part/sec

(a)			
(b)			
(c)			

EXTRACTED BEAM PROPERTIES:

For 230 μ A of 3.14 MeV/u P ions
 $\Delta E/E$ 0.85 % $\Delta\phi$ 15 °rf
 $\epsilon_n = \beta\gamma\epsilon$ x 0.98 π mm mrad z 0.49 π mm mrad

FACILITIES FOR RESEARCH

SHIELDED AREA: Fixed: m² Moveable m²

Target Stations: No. Served At Same Time:

MAGNETIC SPECTROMETERS:

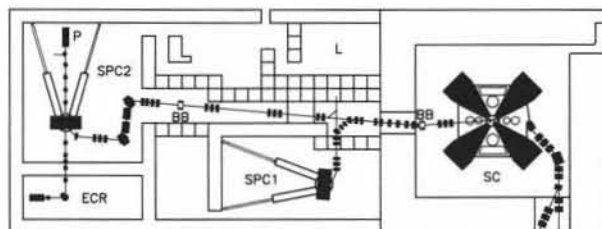
OTHER FACILITIES:

See NAC Separated-Sector Cyclotron

REFERENCES/NOTES

- (a) Proc. Tenth Int. Cycl. Conf. 67.94.373 (1984)
 (b) Proc. Eleventh Int. Cycl. Conf. 9.109 (1986)

PLAN VIEW OF FACILITY, COMMENTS



BB Beamline buncher
 ECR ECR ion source (basement)
 L Low energy experimental area
 P Polarized ion source (basement)
 SPC1 Solid pole injector cyclotron for light ions
 SPC2 Solid pole injector cyclotron for heavy or polarized ions
 SC Separated-sector cyclotron

ACCELERATION SYSTEM

FUNDAMENTAL ACCELERATION:

Description: Two $\lambda/4$ resonators with 90° dees
 No. of Gaps/turn 4 dE/dn(max) 0.24 MeV/q
 Voltage (max) 0.060 MV Harmonic f_H/f_{ion} 2...6
 Freq 8.6 - 26 MHz Power in(max) 2 x 0.025 MW
 Stability: Phase 0.1 deg Voltage 10⁻³

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: 1.5 x 10⁻⁵ mbar

PUMPS: (No. and type) 1 Turbo 4.8 m³ s⁻¹, 1 Roots 350 m³ h⁻¹,
 1 Rotary Vane 60 m³ h⁻¹