

ENTRY NO. C16 Date JULY 1992
 Name of Machine MEDICYC
 Institution CYCLOTRON LABORATORY, CENTRE ANTOINE LACASSAGNE
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 In Charge: P. MANDRILLON Reported by: P. MANDRILLON

HISTORY

MILESTONE DATES:
 Design 1983/1984 Model Tests
 Construction 1984/1989 First Beam extracted in Dec. 90
 DESIGN/CONSTRUCTION BY:
 (in house) other Facility 120 MFF
 COST: Accelerator 56 MFF Facility 120 MFF
 FUNDED BY: Centre Antoine Lacassagne

STATUS

STAFF: Machine
 Scientists 1 Engineers 2
 Technicians 12 Students 1
 Research (in house/external)
 Scientists 1 / Engineers /
 Technicians 2 / Students /
 BUDGET: Machine Funded by
 Research Funded by
 TIME DISTRIBUTION:
 Basic Research (in house/external) 10 % / %
 Applied Program (in house/external) 80 % / %
 Development 10 % Maintenance %

MAGNET

POLE PARAMETERS:
 Diameter 160 cm R_{extract} 68.8 cm R_{inject} 2.5 cm
 HILL PARAMETERS: Gap (min) 13 cm B_{max} 2.15 T
 (@ AT) Gap (max) cm B_{min} T
 VALLEY PARAMETERS: Gap (min) 27 cm B_{max} 1.7 T
 (@ AT) Gap (max) cm B_{min} T
 AVERAGE FIELD: < B >_{min} T < B >_{max} T
 NUMBER OF SECTORS: compact/separated 4 /
 sector angle 42.5 deg. spiral (max) 60 deg.
 FIELD TRIMMING: Trim Coils 10 circular
 Harmonic Coils 4
 Other
 CURRENT: Main Coils 1200 Amps Stability 10⁻⁵
 Trim Coils 100 Amps Stability 10⁻⁴
 Stored Energy (cryogenic) MJ
 WEIGHT: Iron 130 tons Conductor copper
 ION ENERGY: Bending Limit E/A = 70 q²/A² MeV/u
 Focussing Limit E/A = q/A MeV/u

ACCELERATION SYSTEM

FUNDAMENTAL ACCELERATION:
 Description: 2 dees with 75 deg. aperture
 No. of Gaps/turn 4 dE/dn(max) 0.120 MeV/q
 Voltage(max) 0.055 MV Harmonic f_{rf}/f_{ion} 1
 Freq 25 MHz Power in(max) 0.050 MW
 Stability: Phase < 0.5 deg. Voltage 10³
 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: 10⁻⁷ Torr
 PUMPS: No. and type 2 turbo + 2 cryogenics

ION SOURCE(S)

Type	Intensity (mA)	Q	$\epsilon_n = \beta\gamma\epsilon$ (mm mrad)	Ion Species
(a) multi cusp	1		0.15	H ⁻
(b)				
(c)				
(d)				

INJECTION SYSTEM

Axial with spiral inflector Efficiency %

EXTRACTION SYSTEM

By stripping Efficiency 100 %

CHARACTERISTIC BEAMS

Accelerated Ions	E/A (MeV/u)	Current (part μ A)	
		Internal	External
(a) Protons	65	20 μ A	20 μ A
(b)			
(c)			
(d)			

Secondary Particles	E (MeV)	part/sec
(a) Neutrons	20 average	
(b)		
(c)		

EXTRACTED BEAM PROPERTIES:

For μ A of MeV/u ions
 $\Delta E/E$ % $\Delta\phi$ °rf
 $\epsilon_n = \beta\gamma\epsilon$ x π mm mrad z π mm mrad

FACILITIES FOR RESEARCH

SHIELDED AREA: Fixed m² Moveable m²
 Target Stations: No. Served At Same Time:
 MAGNETIC SPECTROMETERS:
 OTHER FACILITIES:

REFERENCES/NOTES

- (a) Proc. 10th Int. Conf. Cycl. and Appl., 1984, MSU
- (b) Proc. 12th Int. Conf. Cycl. and Appl., 1989, Berlin

PLAN VIEW OF FACILITY, COMMENTS

