

ENTRY NO. C28 Date JULY 1992
 Name of Machine L.N.S. SUPERCONDUCTING CYCLOTRON
 Institution I.N.F.N. (ISTITUTO NAZIONALE DI FISICA NUCLEARE)
 Address L.N.S. V.LE A. DORIA ang. V. S. SOFIA 95123 CATANIA ITALY
 Tel (95) 542111 Telex 971432 LNSI Fax (95) 7141815 EMAIL BIRLIO@LNS.INFN.IT
 In Charge: E. MIGNECO Reported by: L. CALABRETTA

HISTORY
 MILESTONE DATES:
 Design 1975-76 Model Tests 1977
 Construction STARTED FEB. 81 First Beam GOAL 1993
 DESIGN/CONSTRUCTION BY:
 in house MILAN other 6
 COST: Accelerator \$ 7.10 Facility
 FUNDED BY: I.N.F.N.

STATUS
 STAFF: Machine
 Scientists 14 Engineers 4
 Technicians 22 Students
 Research (in house/external)
 Scientists / Engineers /
 Technicians / Students /
 BUDGET: Machine Funded by
 Research Funded by
 TIME DISTRIBUTION:
 Basic Research (in house/external) % / %
 Applied Program (in house/external) % / %
 Development % Maintenance %

MAGNET
 POLE PARAMETERS:
 Diameter 180 cm Rextract 86.7 cm Rinject 10-25 cm
 HILL PARAMETERS: Gap (min) 8.6 cm Bmax 5.6 T
 (@ 6.55.10. AT) Gap (max) 8.6 cm Bmin T
 VALLEY PARAMETERS: Gap (min) cm Bmax T
 (@ 6.55.10.6 AT) Gap (max) 91.6 cm Bmin T
 AVERAGE FIELD: < B >min 2.2 T < B >max 4.8 T
 NUMBER OF SECTORS: compact/separated 3 / COMPACT
 sector angle deg. spiral (max) 69 2 deg.
 FIELD TRIMMING: Trim Coils 20-CONDUCTOR: COPPER 6X6 mm
 Harmonic Coils
 Other
 CURRENT: Main Coils 2000 Amps Stability 10 e-5
 Trim Coils 500 Amps Stability 10 e-4
 Stored Energy (cryogenic) 40 MJ
 WEIGHT: Iron 176 TONS Conductor 9.6 TONS
 ION ENERGY: Bending Limit E/A = .800 q²/A² MeV/u
 Focussing Limit E/A = .200 q/A MeV/u

ACCELERATION SYSTEM
 FUNDAMENTAL ACCELERATION:
 Description: 3 DEES WITH ANGLE OF 58 DEG.
 No. of Gaps/turn 6 dE/dn(max) 0.480 MeV/q
 Voltage(max) 0.1 MV Harmonic f_{rf}/f_{ion} 1.2 3
 Freq 15-49 MHz Power in(max) 0.18 MW
 Stability: Phase 0.5 DEG Voltage 10 e-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 e-7 Torr
 PUMPS: No. and type 4 CRYOPUMPS

ION SOURCE(S)

Type	Intensity (mA)	Q	$\epsilon_n = \beta\gamma\epsilon$ (mm mrad)	Ion Species
(a)				
(b)				
(c)				
(d)				

INJECTION SYSTEM
 RADIAL FROM 15 MV TANDEM AND AXIAL Efficiency %
 FROM ECR SOURCE
EXTRACTION SYSTEM
 ELECTROSTATIC DEFLECTOR(2) AND MAGNETIC CHANNELS(7) Efficiency %

CHARACTERISTIC BEAMS

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

Secondary Particles	E (MeV)	part/sec
(a)		
(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 2000 m² Moveable m²
 Target Stations: 6 No. Served At Same Time:
MAGNETIC SPECTROMETERS:
 OTHER FACILITIES: Fragment Recoil Separator

REFERENCES/NOTES
 (a) E. ACERBI et al. XI Int. Conf. on Cycl. 16B(1988)
 (b) E. ACERBI et al. XII Int. Conf. on Cycl. 26(1989)

PLAN VIEW OF FACILITY, COMMENTS

