

ENTRY No. FM-1

NAME OF MACHINE 180 cm Synchrocyclotron DATE July 1981
 INSTITUTION COMISION NACIONAL DE ENERGIA ATOMICA
 ADDRESS Av. Libertador 8250, 1429 Buenos Aires, Argentina
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 IN CHARGE A. Filevich REPORTED BY A. Filevich

HISTORY AND STATUS

DESIGN, date Model tests
 ENG DESIGN, date
 CONSTRUCTION, date 1952
 FIRST BEAM, date (or goal) November 1954
 MAJOR ALTERATIONS 1968

COST, ACCELERATOR 10⁶ DOLLARS
 COST, FACILITY, total 2x10⁶ DOLLARS
 FUNDED BY CNEA

ACCELERATOR STAFF, OPERATION AND DEVELOPMENT

SCIENTISTS 3 ENGINEERS 3
 TECHNICIANS 8 CRAFTS 2
 GRAD STUDENTS involved during year
 OPERATED BY CNEA Research staff or Operators
 OPERATION 90 hr/wk, On target 80 hr/wk
 TIME DISTR. in house 95 % Outside 5 %
 BUDGET, op & dev 70,000 U\$S
 FUNDED BY CNEA

RESEARCH STAFF, not included above

USERS, in house 10 outside 10
 GRAD STUDENTS involved during year 4
 RESEARCH BUDGET, in house 75,000 U\$S
 FUNDED BY CNEA

MAGNET

POLE FACE, diameter (compact) 180 cm, R extraction 76 cm
 R injection cm
 GAP, min cm, Field kG
 max 35.5 cm, Field 14.4 kG } at
 AVERAGE FIELD at R ext kG Ampere turns
 B max/

NUMBER OF SECTORS { compact } Spiral, max .. deg
 separated }
 SECTOR ANGLE (SSC) deg
 TRIMMING COILS

CONDUCTOR, material and type Aluminum
 STORED ENERGY (cryogenic) MJ
 POWER: main coils 220 max, kW ; current stability 10/10⁶
 trimming coils max, kW ; current stability
 WEIGHT: Fe 180 tons ; coils 9 tons
 COOLING system water flow
 ION ENERGY (bending limit) E/A = q²/a² MeV/amu
 (focusing limit) E/A = q/a MeV/amu

ACCELERATION SYSTEM

DEES, number one ; angle 180 deg
 BEAM APERTURE 10 cm ; DC Bias -0.5 kV
 TUNED by, coarse fine
 RF 10.1 to 10.5 mHz, stable ± 10/10⁶
 Orb F to mHz
 HARMONICS, RF/Orb F, used
 DEE - Gnd, max 12 kV, min gap 10 cm
 STABILITY, (pk-pk noise)/(pk RF volt)
 ENERGY GAIN, max 19 kV/turn
 RF PHASE, stable to ± deg
 RF POWER input, max 29 kW
 FREQUENCY MODULATION, rate 2000 /s
 modulator, type rotating capacitor
 beam pulse, width 30 μs

VACUUM SYSTEM

OPERATING PRESSURE 19 μ Torr
 PUMPS, No, Type, Size 3 oil diffusion

ION SOURCES

Arc and filament type

INJECTION SYSTEM**EXTRACTION SYSTEM**

Regenerative with magnetic channel

FACILITIES FOR RESEARCH

SHIELDED AREA, fixed 25 m² ; movable m²
 TARGET STATIONS 3 in 1 rooms
 STATIONS served at same time, max
 MAG SPECTROGRAPH, type
 COMPUTER model VAX 11/780
 OTHER FACILITIES OFF LINE
 ANGULAR CORRELATION TABLE

CHARACTERISTIC BEAMS

PARTICLE	ENERGY (MeV)		CURRENT (pμA)	
	Goal	Achieved	Internal	External
d	28	27,2	15	0.020
α	56	55	4	0.002

SECONDARY

(part/s)

BEAM PROPERTIES

MEASURED	CONDITIONS	
	MEASURED	CONDITIONS
PULSE WIDTH RF deg	pμ A of MeV ions	
PHASE EXC, max RF deg	pμ A of MeV ions	
EXTRACT eff %	pμ A of MeV ions	
RESOL ΔE/E 1 %	pμ A of MeV ions	
EMITTANCE		
(π mm. mrad) { 50 axial } { 70 rad }	3 pμA of 27 MeV d ions	

OPERATING PROGRAMS, time distribution

BASIC NUCLEAR PHYSICS 90% SOLID STATES PHYSICS
 BIOMEDICAL APPLICAT. 5% ISOTOPE PRODUCTIONS 5%

REFERENCES/NOTES**PLAN VIEW OF FACILITY, NOTEWORTHY FEATURES, COMMENTS**