

ENTRY No. 3

NAME OF MACHINE AVF - CGR - MeV 520 DATE 20 May 1989
 INSTITUTION Université de Liège
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HISTORY AND STATUS

DESIGN, date 1972 Model tests 1973
 ENG DESIGN, date 1973
 CONSTRUCTION, date 1973 - 1975
 FIRST BEAM, date (or goal) 23.03.75
 MAJOR ALTERATIONS 1983 improved tuning panels and dees
 COST, ACCELERATOR
 COST, FACILITY, total
 FUNDED BY Government and University
ACCELERATOR STAFF, OPERATION AND DEVELOPMENT
 SCIENTISTS ENGINEERS 1
 TECHNICIANS 5 CRAFTS 1
 GRAD STUDENTS involved during year 1
 OPERATED BY Research staff or 5 Operators
 OPERATION 60 hr/wk, On target 55 hr/wk
 TIME DISTR. in house % Outside %
 BUDGET, op & dev
 FUNDED BY
RESEARCH STAFF, not included above
 USERS, in house 10 outside 10
 GRAD STUDENTS involved during year
 RESEARCH BUDGET, in house
 FUNDED BY IRSN - FNRS - FRSM - University
MAGNET
 POLE FACE, diameter (compact) 120 cm, R extraction 52.5 cm
 R injection cm
 GAP, min 8.6 cm, Field 17.5 kG }
 max 14.0 cm, Field 11.0 kG } at 150x10⁶
 AVERAGE FIELD at R ext 14.8 kG } Ampere turns
 B max/ < B > 1.18
 NUMBER OF SECTORS { compact 4 } Spiral, max 3.4 deg
 separated
 SECTOR ANGLE (ISSC) deg
 TRIMMING COILS
 CONDUCTOR, material and type Cu
 STORED ENERGY (cryogenic) MJ
 POWER: main coils 76 max, kW; current stability
 trimming coils 10 max, kW; current stability
 WEIGHT: Fe 28 tons; coils tons
 COOLING system deionized water
 ION ENERGY (bending limit) E/A = 29 q²/a² MeV/amu
 (focusing limit) E/A = q²/a² MeV/amu

ACCELERATION SYSTEM

DEES, number 2; angle 50 deg
 BEAM APERTURE 2.5 cm; DC Bias kV
 TUNED by, coarse S.C. piston fine panel
 RF 19.5 to 41 MHz, stable ± 10⁻⁶
 Orb F 4.9 to 20.5 MHz
 HARMONICS, RF/Orb F, used 2, 3, 4
 DEE - Gnd, max 35 kV, min gap 25 cm
 STABILITY, (pk-pk noise)/(pk RF volt) .002
 ENERGY GAIN, max kV/turn
 RF PHASE, stable to ± 2 deg
 RF POWER input, max 85 kW
 FREQUENCY MODULATION, rate /s
 modulator, type
 beam pulse, width

VACUUM SYSTEM

OPERATING PRESSURE 10⁻⁶ Torr or mbar
 PUMPS, No, Type, Size diffusion (3200 l/sec.)
 primary (60 m³/h)

ION SOURCES

axial, Livingston - Jones

INJECTION SYSTEM

EXTRACTION SYSTEM

electrostatic deflector, passive corrector

FACILITIES FOR RESEARCH

SHIELDED AREA, fixed 700 m²; movable m²

TARGET STATIONS 7 in 5 rooms

STATIONS served at same time, max 1

MAG SPECTROGRAPH, type

COMPUTER model Fluke Helios

OTHER FACILITIES radiochemistry (automated production

of labeled compounds), medical unit (Cat. II and Neuro

Cat. positron scanners), radiopharmacy, biological labora-

CHARACTERISTIC BEAMS tories.

PARTICLE	ENERGY (MeV)		CURRENT (pA)	
	Goal	Achieved	Internal	External
p	6-20	2.5-24	300	100
d	3-11.5	3-14.5	500	100
³ He	6-29	6-32	200	100
⁴ He	6-24	6-29	100	60

SECONDARY (part/s)

BEAM PROPERTIES

MEASURED CONDITIONS
 PULSE WIDTH RF deg pA of MeV ions
 PHASE EXC, max RF deg pA of MeV ions
 EXTRACT eff 50-70 % 30 pA of 21 MeV p ions
 RESOL ΔE/E 5 % pA of MeV ions
 EMITTANCE
 (π mm. mrad) { 15. axial } pA of MeV ions
 { 15. rad }

OPERATING PROGRAMS, time distribution

BASIC NUCLEAR PHYSICS 30 % SOLID STATES PHYSICS 30 %
 BIOMEDICAL APPLICAT. 40 % ISOTOPE PRODUCTIONS 30 %

REFERENCES/NOTES

PLAN VIEW OF FACILITY, NOTEWORTHY FEATURES, COMMENTS

