ENTRY No. 17

NAME OF MACHINE MGC 20 DATE 10.05.1989
INSTITUTION Acceleratorlaboratoriet vid Abo Akademi
ADDRESS Porthansgatan 3-5 20500 Abo Finland
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IN CHARGE Mårten Brenner REPORTED BY Stefan Johansson

HISTORY AND STATUS

DESIGN, date ..... Model tests .....
ENG DESIGN, date .....
CONSTRUCTION, date Dec. 1973 to Oct. 1974
FIRST BEAM, date (or goal) July 1974 Int/Ext
MAJOR ALTERATIONS .....
.....
COST, ACCELERATOR 4 MFmk
COST, FACILITY, total .....
FUNDED BY Finnish Government

ACCELERATOR STAFF, OPERATION AND DEVELOPMENT

SCIENTISTS 3 ENGINEERS 1
TECHNICIANS 2 CRAFTS .....
GRAD STUDENTS involved during year 10
OPERATED BY ..... Research staff or * ..... Operators
OPERATION 60 hr/wk, On target ..... hr/wk
TIME DISTR. in house 55% %, Outside 45% %
BUDGET, op & dev 600 000 Fmk
FUNDED BY .....

RESEARCH STAFF, not included above

USERS, in house 10 outside 20
GRAD STUDENTS involved during year 7
RESEARCH BUDGET, in house 2 MFmk
FUNDED BY Finnish Government

MAGNET

POLE FACE, diameter (compact) 103 cm, R extraction 45 cm
R injection ..... cm
GAP, min 7.2 cm, Field 16.5 kG
max 12 cm, Field 12.5 kG } at 0.12×10^6
AVERAGE FIELD at R ext 14.5 kG } Ampere turns
B max/ <B> 1.13
NUMBER OF SECTORS { compact 3 / separated ..... } Spiral, max 35 deg
SECTOR ANGLE (SSC) ..... deg
TRIMMING COILS 4 pairs of concentric
2 sets of harmonic
CONDUCTOR, material and type Cu tube
STORED ENERGY (cryogenic) ..... MJ
POWER : main coils 35 max, kW ; current stability 0.01%
trimming coils 1 max, kW ; current stability 0.1%
WEIGHT : Fe 24 tons ; coils 1.2 tons
COOLING system Demineralised water
ION ENERGY (bending limit) E/A = ... q^2/a^2 MeV/amu
(focusing limit) E/A = ... q^2/a^2 MeV/amu

ACCELERATION SYSTEM

DEES, number 2 ; angle 140 deg
BEAM APERTURE 1.9 cm ; DC Bias ..... kV
TUNED by, coarse panels fine trim capacitors
RF 8.5 to 25.5 mHz, stable ± 10 ppm
Orb F ..... to ..... mHz
HARMONICS, RF/Orb F, used 1,3
DEE - Gnd, max 30 kV, min gap 0.4 cm
STABILITY, (pk-pk noise)/(pk RF volt) 0.001
ENERGY GAIN, max 120 kV/turn
RF PHASE, stable to ± 5 deg
RF POWER input, max 50 kW
FREQUENCY MODULATION, rate ..... /s
modulator, type .....
beam pulse, width .....

VACUUM SYSTEM

OPERATING PRESSURE 5×10^{-6} Torr or mbar
PUMPS, No, Type, Size 2 diffusion pumps
1600 l/s with baffles
.....

ION SOURCES

Hot Filament Livingston

INJECTION SYSTEM

.....

EXTRACTION SYSTEM

Electrostatic deflector + magnetic channel

FACILITIES FOR RESEARCH

SHIELDED AREA, fixed 150 m^2 ; movable ..... m^2
TARGET STATIONS 5 in 2 rooms
STATIONS served at same time, max 1
MAG SPECTROGRAPH, type .....
COMPUTER model .....
OTHER FACILITIES Scattering chamber
.....
.....

CHARACTERISTIC BEAMS

PARTICLE	ENERGY (MeV) Goal	Achieved	CURRENT (pμA) Internal	External
p	18	19	300	50
d	10	10.5	300	50
α	20	21	100	40
^{3}He	24	29	90	40
SECONDARY				(part/s)
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....

BEAM PROPERTIES

MEASURED	CONDITIONS
PULSE WIDTH ..... RF deg	..... pμ A of .... MeV ... ions
PHASE EXC, max ... RF deg	..... pμ A of .... MeV ... ions
EXTRACT eff 50 %	20 pμ A of 21 MeV p ions
RESOL ΔE/E 0.3 %	0.4 pμ A of 18 MeV p ions
EMITTANCE	
(π mm. mrad) { axial / rad }	..... pμA of ..... MeV ... ions

OPERATING PROGRAMS, time distribution

BASIC NUCLEAR PHYSICS 43% SOLID STATES PHYSICS ....
BIOMEDICAL APPLICAT. 13% ISOTOPE PRODUCTIONS 32%
Development / service 12%
.....

REFERENCES/NOTES

PLAN VIEW OF FACILITY, NOTEWORTHY FEATURES, COMMENTS