ENTRY No. 19

NAME OF MACHINE K130 cyclotron DATE April 28, 1989
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IN CHARGE E. Liukkonen REPORTED BY T. Poikolainen

HISTORY AND STATUS
DESIGN, date 1988 Model tests None 1)
ENG DESIGN, date 1988-89 1)
CONSTRUCTION, date 1988-90 1)
FIRST BEAM, date (or goal) 1991
MAJOR ALTERATIONS
COST, ACCELERATOR 30 500 000 FIM
COST, FACILITY, total 100 000 000 FIM
FUNDED BY Government of Finland

ACCELERATOR STAFF, OPERATION AND DEVELOPMENT
SCIENTISTS ENGINEERS
TECHNICIANS CRAFTS
GRAD STUDENTS involved during year
OPERATED BY Research staff or Operators
OPERATION hr/wk, On target hr/wk
TIME DISTR. in house %, Outside %
BUDGET, op & dev
FUNDED BY

RESEARCH STAFF, not included above
USERS, in house outside
GRAD STUDENTS involved during year
RESEARCH BUDGET, in house
FUNDED BY

MAGNET
POLE FACE, diameter (compact) 240 cm, R extraction 95 cm
R injection 3 cm
GAP, min 17.4 cm, Field 21 kG
max 33 cm, Field 13 kG
at 400 000 Ampere turns
AVERAGE FIELD at R ext 17.6 kG
B max/ <B> 1.2
NUMBER OF SECTORS compact 3 / separated — Spiral, max 58 deg
SECTOR ANGLE (SSC) deg
TRIMMING COILS 4 sets in valleys, 15 circular
CONDUCTOR, material and type Hollow copper
STORED ENERGY (cryogenic) MJ
POWER : main coils 150 max, kW ; current stability 10-5
trimming coils 35 max, kW ; current stability
WEIGHT : Fe 300 tons ; coils 3 tons
COOLING system Demineralized water
ION ENERGY (bending limit) E/A = 130 q²/a² MeV/amu
(focusing limit) E/A = 90 q²/a² MeV/amu

ACCELERATION SYSTEM
DEES, number 2 ; angle 78 deg
BEAM APERTURE 3 cm ; DC Bias - kV
TUNED by, coarse MS fine VC
RF 10 to 21 mHz, stable ± 10^{-6}
Orb F 3.3 to 21 mHz
HARMONICS, RF/Orb F, used 1, 2, 3
DEE - Gnd, max 50 kV, min gap 0.8 cm
STABILITY, (pk-pk noise)/(pk RF volt)
ENERGY GAIN, max 200 kV/turn
RF PHASE, stable to ± deg
RF POWER input, max 120 kW
FREQUENCY MODULATION, rate /s
modulator, type
beam pulse, width

VACUUM SYSTEM
OPERATING PRESSURE 10^{-7} Torr or mbar
PUMPS, No, Type, Size 2 cryo pumps 5000 ℓ/s (for nitrogen)

ION SOURCES External ECR

INJECTION SYSTEM
Axial, spiral inflector

EXTRACTION SYSTEM
electrostatic defl. + EMC + 2 passive channels

FACILITIES FOR RESEARCH
SHIELDED AREA, fixed m² ; movable m²
TARGET STATIONS in rooms
STATIONS served at same time, max
MAG SPECTROGRAPH, type
COMPUTER model
OTHER FACILITIES

CHARACTERISTIC BEAMS

PARTICLE	ENERGY (MeV) Goal	Achieved	CURRENT (pμA) Internal	External
p	6-85	2		50
others (0.2-1.)x130 q²/A				
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	%	pμ A of MeV ... ions
RESOL ΔE/E	%	pμ A of MeV ... ions
EMITTANCE (π mm. mrad)	axial / rad	pμA of MeV ... ions

OPERATING PROGRAMS, time distribution
BASIC NUCLEAR PHYSICS .. SOLID STATES PHYSICS ....
BIOMEDICAL APPLICAT. .... ISOTOPE PRODUCTIONS ....

REFERENCES/NOTES
1) Magnet design calculations made at JYFL. Main components of the cyclotron will be delivered by Scanditronix AB, Sweden.

PLAN VIEW OF FACILITY, NOTEWORTHY FEATURES, COMMENTS