

ENTRY NO. 65 Oslo Cyclotron
 NAME OF MACHINE
 INSTITUTION Dept. of Physics, Univ. of Oslo
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 IN CHARGE REPORTED BY S. Messelt

HISTORY AND STATUS

DESIGN, date Cyclotron Model tests
 ENG DESIGN, date Cyclotron model MC 35
 CONSTRUCTION, date from Scanditronix AB
 FIRST BEAM, date (or goal) 1979
 MAJOR ALTERATIONS

COST, ACCELERATOR
 COST, FACILITY, total
 FUNDED BY Univ. of Oslo & Norw. Res. Council

ACCELERATOR STAFF, OPERATION AND DEVELOPMENT

SCIENTISTS 6 ENGINEERS 2 1/2
 TECHNICIANS CRAFTS
 GRAD STUDENTS involved during year 4 - 6
 OPERATED BY 1 Research staff or 1 Operators
 OPERATION hr/wk. On target hr/wk
 TIME DISTR. in house 100 % , outside %
 BUDGET, op & dev
 FUNDED BY Univ. of Oslo & Res. Council

RESEARCH STAFF, not included above
 USERS, in house outside 3
 GRAD STUDENTS involved during year
 RESEARCH BUDGET, in house
 FUNDED BY Univ. of Oslo & Res. Council

MAGNET
 POLE FACE, diameter (compact) 130 cm, R-extraction 50 cm
 R injection cm
 GAP, min 10 cm, Field kG
 max 18 cm, Field kG at
 AVERAGE FIELD at R ext kG Ampere turns
 B max / < B >

NUMBER OF SECTORS { compact 3 } Spiral, max 50 deg
 { separated }

SECTOR ANGLE (SSC) 4 sets of harmonic deg.
 TRIMMING COILS 8 concentric

CONDUCTOR, material and type Cu
 STORED ENERGY (cryogenic) MJ
 POWER: main coils 100 max kW: current stability 10 - 5
 trimming coils 10 max kW: current stability

WEIGHT: Fe 53 Water tons: coils 2.3 tons
 COOLING system

ION ENERGY (Bending limit) E/A = 35 q²/A² MeV/amu
 (Focusing limit) E/A = q/A MeV/amu

ACCELERATION SYSTEM

DEES, number 2 angle 90 deg
 BEAM APERTURE 2 cm; DC Bias 0 kV
 TUNED by, coarse Mov. short fine aut. flaps

RF 12 to 27 MHz, stable ± 10 - 6
 Orb F to MHz
 HARMONICS, RF/Orb F, used first, second

DEE-Gnd, max 40 kV, min gap cm
 STABILITY, (pk-pk noise)/(pk RF volt)

ENERGY GAIN, max 110 kV/turn
 RF PHASE, stable to ± deg
 RF POWER input, max. 40 kW
 FREQUENCY MODULATION, rate /s

modulator, type
 beam pulse, width

VACUUM SYSTEM

OPERATING PRESSURE < 10 - 5 Torr or mbar
 PUMPS, No, Type, Size 2 diff.
 3 turbo-mol.

ION SOURCES
 Cold cath. PIG with two chimneys

INJECTION SYSTEM

EXTRACTION SYSTEM
 Electr. defl. and magn. channel

FACILITIES FOR RESEARCH
 SHIELDED AREA, fixed 150 m²; movable m²
 TARGET STATIONS 4 in 2 rooms

STATIONS served at same time, max
 MAG SPECTROGRAPH type
 COMPUTER model ND 10 to be replaced with ND 5xx
 OTHER FACILITIES

CHARACTERISTIC BEAMS

PARTICLE	ENERGY (MeV)		CURRENT (µA)	
	Goal	Achieved	Internal	External
p		8-35		65
d		4-18		65
3He		6-47		30
4He		8-35		30
SECONDARY			(part/s)	

BEAM PROPERTIES

MEASURED CONDITIONS
 PULSE WIDTH 13 RF deg 5 µA of 20 MeV p ions
 PHASE EXC. max RF deg µA of MeV ions
 EXTRACT eff 80 % µA of MeV ions
 RESOL ΔE/E < 0.4 % µA of MeV ions
 EMITTANCE
 (π mm-mrad) 25 axial µA of MeV
 30 rad

OPERATING PROGRAMS, time distribution
 BASIC NUCLEAR PHYSICS 95% SOLID STATES PHYSICS
 BIOMEDICAL APPLICAT ISOTOPE PRODUCTIONS
 Nucl. chem. 5%

REFERENCES/NOTES

- 1)
- 2)

PLAN VIEW OF FACILITY, COMMENTS, ETC.

Description of research programs, 3He recycling systems, msec. pulsing of ion source, external electr. deflector for pulse selction, see Annual Reports 1979-85, Nuclear Physics Group, Univ. of Oslo.