

ENTRY NO. FM-6

NAME OF MACHINE SFSC 200
 INSTITUTION The Svedberg Laboratory
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 IN CHARGE A. Johansson REPORTED BY S. Holm

HISTORY AND STATUS

DESIGN, date 1946, 1977 Model tests 1974-1978
 ENG DESIGN, date 1946-1951, 1977-1984
 CONSTRUCTION, date 1947-1951, 1979-1986
 FIRST BEAM, date (or goal) 1951, 1986
 MAJOR ALTERATIONS Complete reconstruction to
 AVF c.w and f.m cyclotron
 COST, ACCELERATOR Reconstruction 25 MSEK
 COST, FACILITY, total 70 MSEK
 FUNDED BY Sw. Govt, Sc. Res. Council, Uppsala
ACCELERATOR STAFF, OPERATION AND DEVELOPMENT Univ.
 SCIENTISTS 2 ENGINEERS 11
 TECHNICIANS 4 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 6 MSEK
 FUNDED BY University, Nat. Sci. Res. Council
RESEARCH STAFF, not included above
 USERS, in house 10 outside 50
 GRAD STUDENTS involved during year
 RESEARCH BUDGET, in house 6 MSEK
 FUNDED BY University, Nat. Sci. Res. Council

MAGNET

POLE FACE, diameter (compact) 280 cm, R-extraction 120 cm
 R injection cm
 GAP, min 20 cm, Field kG
 max 36 cm, Field kG } at 0.7 * 10⁶
 AVERAGE FIELD at R ext 17.5 kG Ampere turns
 B max / < B >
 NUMBER OF SECTORS { compact 3 } Spiral, max deg
 separated
 SECTOR ANGLE (SSC) deg
 TRIMMING COILS 13 pairs circular
 2 sets harmonic
 CONDUCTOR, material and type Cu, hollow
 STORED ENERGY (cryogenic) MJ
 POWER: main coils 300 max kW: current stability 10 ppm
 trimming coils 60 max kW: current stability 100 ppm
 WEIGHT: Fe 600 tons: coils tons
 COOLING system demineralized water
 ION ENERGY (Bending limit) E/A = 200 q²/A² MeV/amu
 (Focusing limit) E/A = 110 q/A MeV/amu

ACCELERATION SYSTEM

DEES, number 2; angle decreasing from 72 deg.
 BEAM APERTURE 4.2-2.5 cm; DC Bias kV
 TUNED by, coarse moving short fine plunger
 RF 24 to 12 MHz, stable ±
 Orb F 24 to 6 (3) MHz
 HARMONICS, RF/Orb F, used 1, 2 (3, 4)
 DEE-Gnd, max 50 kV, min gap 0.5 cm
 STABILITY, (pk-pk noise)/(pk RF volt)
 ENERGY GAIN, max 200 kV/turn
 RF PHASE, stable to ± deg
 RF POWER input, max 200 kW
 FREQUENCY MODULATION, rate ≤ 1000 /s
 modulator, type broad-band
 beam pulse, width ≤ 25 μs

VACUUM SYSTEM

OPERATING PRESSURE < 10⁻⁶ Torr or mbar
 PUMPS, No, Type, Size 2 oil diff. pumps
 each 20000 l/s

ION SOURCES

Internal PIG; future external

INJECTION SYSTEM

EXTRACTION SYSTEM

Regenerative and precessional, el-and magn.
 channels
FACILITIES FOR RESEARCH
 SHIELDED AREA, fixed 650 m²; movable m²
 TARGET STATIONS 10 in 6 rooms
 STATIONS served at same time, max 2
 MAG SPECTROGRAPH, type Dipole 135°, pairspectrom
 COMPUTER model 2 μ-VAXII, NORD 10-s
 OTHER FACILITIES Storage ring CELSIUS
 under construction, Tandem v.d.G.

CHARACTERISTIC BEAMS

PARTICLE	ENERGY (MeV)		CURRENT (pμA)	
	Goal	Achieved	Internal	External
P	10-200			
d	25-100			
α	50-200			
heavier	≤ 200 q ² /M			
SECONDARY			(part/s)	

BEAM PROPERTIES

MEASURED	CONDITIONS	
	RF deg	μA of MeV ions
PULSE WIDTH	RF deg	μA of MeV ions
PHASE EXC. max	RF deg	μA of MeV ions
EXTRACT eff.	%	μA of MeV ions
RESOL ΔE/E	%	μA of MeV ions
EMITTANCE		
(π mm-mrad)	axial rad	μA of MeV ions

OPERATING PROGRAMS, time distribution

BASIC NUCLEAR PHYSICS SOLID STATES PHYSICS
 BIOMEDICAL APPLICAT. ISOTOPE PRODUCTIONS

REFERENCES/NOTES

Status Report on the Uppsala Synchrocyclotron
 and CELSIUS Cooler Ring Project
 Proc of this conference

PLAN VIEW OF FACILITY, COMMENTS, ETC.

