

ENTRY NO. FM-6 SFSC-200
 NAME OF MACHINE
 INSTITUTION The Gustaf Werner Institute, University of Uppsala
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 IN CHARGE Sven Kullander REPORTED BY Stig Holm

HISTORY AND STATUS

DESIGN, date 1946, 1977... Model tests 1974-1978
 ENG DESIGN, date 1946-1951, 1977-
 CONSTRUCTION, date 1947-1951, 1977-
 FIRST BEAM, date (or goal) 1951, goal 1985
 MAJOR ALTERATIONS Complete reconstruction
 to AFV cyclotron
 COST, ACCELERATOR Reconstruction approx 25 MSEK
 COST, FACILITY, total 60 MSEK
 FUNDED BY Sw. Govt., SC. Res. Council, University

ACCELERATOR STAFF, OPERATION AND DEVELOPMENT

SCIENTISTS 2 ENGINEERS 14
 TECHNICIANS 6 CRAFTS 4
 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 10 MSEK
 FUNDED BY Science Research Council
RESEARCH STAFF, not included above
 USERS, in house 19 outside 5
 GRAD STUDENTS involved during year 14
 RESEARCH BUDGET, in house 6 MSEK
 FUNDED BY Science Research Council, University

MAGNET

POLE FACE, diameter (compact) 280 cm, R extraction 120 cm
 R injection cm
 GAP, min 20 cm, Field kg }
 min 36 cm, Field kg } at $0.7 \cdot 10^6$
 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 50 tons
 COOLING system demineralized water
 ION ENERGY (bending limit) E/A = 200 q/a 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 variable < 1000 /s
 modulator, type broad-band
 beam pulse, width < 25 μs

VACUUM SYSTEM

OPERATING PRESSURE < 10 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°
 COMPUTER model not yet decided
 OTHER FACILITIES Storage ring CELSIUS
 under construction

CHARACTERISTIC BEAMS

PARTICLE	ENERGY (MeV)		CURRENT (μA)	
	Goal	Achieved	Internal	External
p	10-200			
d	25-100			
³ He ²⁺	35-270			
heavier	<200 q ² /M			
SECONDARY			(part/s)	

BEAM PROPERTIES

	MEASURED		CONDITIONS	
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			μA of	MeV
(π mm. mrad)	{ axial }			
	{ rad }			

OPERATING PROGRAMS, time distribution

BASIC NUCLEAR PHYSICS SOLID STATES PHYSICS
 BIOMEDICAL APPLICAT ISOTOPE PRODUCTIONS

REFERENCES/NOTES

- 1) Proc. Eighth Int Cycl Conf (1978), p.2012-2015
- 2) The Uppsala Synchrocyclotron and Storage Ring Projekt, Proc of this conference

PLAN VIEW OF FACILITY, COMMENTS, ETC.

