**ENTRY NO.** 61
NAME OF MACHINE Stockholm 225-cm cyclotron DATE March 1984
INSTITUTION Research Institute of Physics
ADDRESS S-104 05 STOCKHOLM, Sweden
TEL 08/15 03 60 TELEX
IN CHARGE C.J.Herrlander/ A. Johnson REPORTED BY A. Johnson and L.O. Norlin

**HISTORY AND STATUS**
DESIGN, date 1946 Model tests 1946 (RF)
ENG DESIGN, date 1946
CONSTRUCTION, date 1946
FIRST BEAM, date (or goal) 1951 (full radius)
MAJOR ALTERATIONS New RF system in operation since 1973
COST, ACCELERATOR
COST, FACILITY, total
FUNDED BY Sw. govt., Sw. Atom.Com., Wallenberg Found.

**ACCELERATOR STAFF, OPERATION AND DEVELOPMENT**
SCIENTISTS 2 ENGINEERS and
TECHNICIANS 10 CRAFTS 2
GRAD STUDENTS involved during year
OPERATED BY Research staff or x Operators
OPERATION ~105 (a) hr/wk. On target ~90 hr./wk
TIME DISTR. in house % Outside %
BUDGET, op & dev
FUNDED BY Sw.Gvt., Sw.Nat.Sci.Res. Council

**RESEARCH STAFF,** not included above
USERS, in house ~15 outside ~25
GRAD STUDENTS involved during year 7
RESEARCH BUDGET, in house
FUNDED BY Sw.Govt., Sw. Nat. Sci. Res. Council

**MAGNET**
POLE FACE, diameter (compact) 225 cm, R extraction 90 cm
R injection cm
GAP, min 33 cm, Field 16 (b) kG } at
min cm, Field kG } at
AVERAGE FIELD at R ext kG } Ampere turns
B max/ < B >
NUMBER OF SECTORS { compact / separated } Spiral, max deg
SECTOR ANGLE (SSC) deg
TRIMMING COILS
CONDUCTOR, material and type Cu bars, hollow
STORED ENERGY (cryogenic) MJ
POWER: main coils 125 (b) max, kW; current stability 10 ppm
trimming coils max, kW; current stability
WEIGHT: Fe 370 tons; coils 27 tons
COOLING system deionized water
ION ENERGY (bending limit) E/A = 104 $q^2/a^2$ MEV/amu
(focusing limit) E/A = q/a MeV/amu

**ACCELERATION SYSTEM**
DEES, number 2 angle 180 deg
BEAM APERTURE 12-5 cm; DC Bias 0 kV
TUNED by, coarse short pl+cap fine trim cap
RF 7 to 10 mHz, stable ± 0.01 ppm
Orb F 7 to 10 mHz
HARMONICS, RF/Orb F, used
DEE—Gnd, max 120 kV, min gap 8 cm
STABILITY, (pk-pk noise)/(pk RF volt) ≦0.2%
ENERGY GAIN, max kV/turn
RF PHASE, stable to ± deg
RF POWEP input, max 250 kW
FREQUENCY MODULATION, rate /s
modulator, type
beam pulse, width

**VACUUM SYSTEM**
OPERATING PRESSURE $5 \cdot 10^{-6}$ Torr or mbar
PUMPS, No, Type, Size 3 oil diff. pumps (one 50 cm, two 40 cm). Two cryogenic pumps à 3000 l/s

**ION SOURCES**
Internal PIG source, indirectly heated cathode
(a) Operation ~25 wks/year
(b) Max field used, max attainable 20 kG

**INJECTION SYSTEM**

**EXTRACTION SYSTEM**
electrostatic deflector

**FACILITIES FOR RESEARCH**
SHIELDED AREA, fixed 0 m²; movable 625 m²
TARGET STATIONS 6 in 5 rooms
STATIONS served at same time, max
MAG SPECTROGRAPH, type
COMPUTER model VAX 11/780 and PDP 11/55
OTHER FACILITIES external pulsing up to 1,7 usec

**CHARACTERISTIC BEAMS**

| PARTICLE | ENERGY (MeV) Goal | Achieved | CURRENT (pμA) Internal | External |
|---|---|---|---|---|
| $^4He^{2+}$ | 30-65 | 32-64 | | 0.5 |
| $^{12}C^{4+}$ | 96-135 | 106-130 | | 0.1 |
| $^{14}N^{5+}$ | 112-186 | 124-151 | | 0.05 |
| $^{20}Ne^{6+}$ | 160-188 | 176 | | 0.001 |
| 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 ($\pi$ mm. mrad) { .....axial / .....rad } | ..... pμ A of ..... MeV ..... |

**OPERATING PROGRAMS,** time distribution
BASIC NUCLEAR PHYSICS main SOLID STATES PHYSICS
BIOMEDICAL APPLICAT. yes ISOTOPE PRODUCTIONS yes
Atomic Physics yes

**REFERENCES/NOTES**
1)
2)

**PLAN VIEW OF FACILITY, COMMENTS, ETC.**