ENTRY NO. 22

NAME OF MACHINE VICKSI

INSTITUTION HAHN-MEITNER-INSTITUTE

ADDRESS 1000 BERLIN 39, GLIENICKER STR. 100 (WEST GERMANY)

TEL (030) 80 09 2414 TELEX 01-85 763

IN CHARGE K. ZIEGLER REPORTED BY K. ZIEGLER

HISTORY AND STATUS

DESIGN, date 73-74 Model tests 73-74

ENG DESIGN, date 73-75

CONSTRUCTION, date 74-76

FIRST BEAM, date (or goal) JUNE 77

MAJOR ALTERATIONS NONE

COST, ACCELERATOR

COST, FACILITY, total DM 40 MILLION

FUNDED BY BERLIN (10 %) + FRG (90 %)

ACCELERATOR STAFF, OPERATION AND DEVELOPMENT

SCIENTISTS 5 ENGINEERS 7

TECHNICIANS 16 CRAFTS 15

GRAD STUDENTS involved during year --

OPERATED BY -- Research staff or 7 Operators

OPERATION 168 hr/wk. On target 115 hr./wk

TIME DISTR. in house 70 % Outside 30 %

BUDGET, op & dev 2.6 MILLION DM

FUNDED BY BERLIN (10 %) + FRG (90 %)

RESEARCH STAFF, not included above

USERS, in house ~50 outside ~35

GRAD STUDENTS involved during year 15

RESEARCH BUDGET, in house 2.5 MILLION

FUNDED BY BERLIN (10 %) + FRG (90 %)

MAGNET

POLE FACE, diameter (compact) -- cm, R extraction 171 cm

R injection 43 cm

GAP, min 6 cm, Field 15.7 kG
min open cm, Field <1 kG
at $9.8 \cdot 10^5$ Ampere turns

AVERAGE FIELD at R ext 8.9 kG

B max/ < B > 1.74

NUMBER OF SECTORS compact ; separated 4 ; Spiral, max 0 deg

SECTOR ANGLE (SSC) 50 deg

TRIMMING COILS 12 coils per magnet, 3 sets can be used as harmonic coils

CONDUCTOR, material and type hollow copper (main)

STORED ENERGY (cryogenic) -- MJ

POWER: main coils 300 max, kW; current stability $5 \cdot 10^{-5}$

trimming coils 50 max, kW; current stability $5 \cdot 10^{-4}$

WEIGHT: Fe 360 tons; coils 6 tons

COOLING system demineralized water

ION ENERGY (bending limit) E/A = 130 q^2/a^2 MEV/amu

(focusing limit) E/A = q/a MeV/amu

ACCELERATION SYSTEM

DEES, number 2 36 deg

BEAM APERTURE 4 cm; DC Bias 0 kV

TUNED by, coarse Piston fine Flaps

RF 10 to 20 mHz, stable ± $.05/10^6$

Orb F 1.43 to 8.9 mHz

HARMONICS, RF/Orb F, used 2-7

DEE—Gnd, max 100 kV, min gap 3.7 cm

STABILITY, (pk-pk noise)/(pk RF volt) $<10^{-3}$

ENERGY GAIN, max 400 kV/turn

RF PHASE, stable to ± <.05 deg

RF POWEP input, max 90 kW

FREQUENCY MODULATION, rate -- /s

modulator, type --

beam pulse, width --

VACUUM SYSTEM

OPERATING PRESSURE $1 - 5 \cdot 10^{-7}$ Torr or mbar

PUMPS, No, Type, Size

2 Kryopumps 4.2° K)

2 Turbopumps 1450 l/sec

ION SOURCES

Axial Penning Source in 6 MV Van-de-Graaff.
Stripper between Injector and Cyclotron.

INJECTION SYSTEM

radial, 2 magnetic, 1 electrostatic Inflector

EXTRACTION SYSTEM

Electrostatic Deflector, Current Septum, Extraction Magnet

FACILITIES FOR RESEARCH

SHIELDED AREA, fixed ~800 m²; movable -- m²

TARGET STATIONS 16 in 6 rooms

STATIONS served at same time, max 1

MAG SPECTROGRAPH, type Q3D

COMPUTER model PDP 11/70

OTHER FACILITIES External Pulsing System

CHARACTERISTIC BEAMS

PARTICLE	ENERGY (MeV) Goal	Achieved	CURRENT (pμA) Internal	External
^{12}C	50-200	50-315	1-0.001	1-0.001
^{20}Ne	50-200	50-410	1-0.001	1-0.001
^{40}Ar	50-200	50-530	1-0.001	1-0.001
SECONDARY		(part/s)		

BEAM PROPERTIES

MEASURED		CONDITIONS
PULSE WIDTH	~5 RF deg	0.5 pμ A of 150 MeV ^{20}Ne ions
PHASE EXC. max	±3 RF deg	0.5 pμ A of 150 MeV ^{20}Ne ions
EXTRACT eff	~90 %	0.5 pμ A of 150 MeV ^{20}Ne ions
RESOL ΔE/E	10^{-3} %	0.5 pμ A of 150 MeV ^{20}Ne ions
EMITTANCE (π mm. mrad)	5 axial; 6 rad	0.5 pμ A of 150 MeV ^{20}Ne

OPERATING PROGRAMS, time distribution

BASIC NUCLEAR PHYSICS 50% SOLID STATES PHYSICS 30%

BIOMEDICAL APPLICAT -- ISOTOPE PRODUCTIONS --

Atomic Physic 15%

Accelerator Physic 5%

REFERENCES/NOTES

1) IEEE Vol. NS-26, No.2, April 79

2) pages 1872, 2300, 2209, 2355, 2202

2) Proc.9th Int.Conf. on Cycl. and their Appl. page 99

PLAN VIEW OF FACILITY, COMMENTS, ETC.

An 8 MV Tandem accelerator is being added as alternate injector[1]. This will allow to accelerate ions up to ~mass 30 to energies of 32 MeV/A. The project is in the final stage of assembly and testing and is expected to be finished by the end of 1984.

1) NIM 184 (1981) 229