

ENTRY No. 22

NAME OF MACHINE VICKSI DATE July 81
 INSTITUTION HAHN-MEITNER-INSTITUTE
 ADDRESS 1000 BERLIN 39, GLENNICKER STR. 100 (West Germany)
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 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 HAHN-MEITNER-INSTITUTE

ACCELERATOR STAFF, OPERATION AND DEVELOPMENT
 SCIENTISTS 6 ENGINEERS 7
 TECHNICIANS 15 CRAFTS 15

GRAD STUDENTS involved during year
 OPERATED BY Research staff or 7 Operators
 OPERATION 168 hr/wk, On target 100 hr/wk
 TIME DISTR. in house 65 %, Outside 35 %
 BUDGET, op & dev 2.6 Million DM

FUNDED BY HAHN-MEITNER-INSTITUTE
RESEARCH STAFF, not included above
 USERS, in house 50 outside 40
 GRAD STUDENTS involved during year 15
 RESEARCH BUDGET, in house 1.5 Million DM
 FUNDED BY HAHN-MEITNER-INSTITUTE

MAGNET
 POLE FACE, diameter (compact) 171 cm, R extraction 171 cm
 R injection 43 cm
 GAP, min 6 cm, Field 15.7 kG
 max open cm, Field 1 kG } at 9.8-10.5
 AVERAGE FIELD at R ext 8.9 kG } Ampere turns
 B max/ 1.74

NUMBER OF SECTORS { compact 4 } Spiral, max 0 deg
 separated 4
 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
 STORED ENERGY (cryogenic) MJ
 POWER: main coils 300 max, kW; current stability 5-10⁻⁵
 trimming coils 50 max, kW; current stability 5-10⁻⁴
 WEIGHT: Fe 360 tons; coils 6 tons
 COOLING system DeminerIALIZED Water
 ION ENERGY (bending limit) E/A = 130 q²/a² MeV/amu
 (focusing limit) E/A = q/a MeV/amu

ACCELERATION SYSTEM

DEES, number 2; angle 36 deg
 BEAM APERTURE 4 cm; DC Bias 0 kV
 TUNED by, coarse Piston fine Flaps
 RF 10 to 20 MHz, stable ± 0.05 / 10⁶
 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 ± <0.05 deg
 RF POWER input, max 90 kW
 FREQUENCY MODULATION, rate 1/s
 modulator, type 11
 beam pulse, width 11

VACUUM SYSTEM

OPERATING PRESSURE 1-5 x 10⁻⁷ Torr or mbar
 PUMPS, No, Type, Size
2 Cryopumps (4-20 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) | | CURRENT (pA) | |
|------------------|--------------|----------|--------------|----------|
| | Goal | Achieved | Internal | External |
| ¹² C | 50-200 | 50-300 | 1-0.001 | 1-0.001 |
| ²⁰ Ne | 50-200 | 50-400 | 1-0.001 | 1-0.001 |
| ⁴⁰ Ar | 55-200 | 55-400 | 1-0.001 | 1-0.001 |

SECONDARY (part/s)

BEAM PROPERTIES

MEASURED CONDITIONS
 PULSE WIDTH ± 5 RF deg 0.5 pA of 150 MeV ²⁰Ne ions
 PHASE EXC, max ± 2 RF deg 0.5 pA of 150 MeV ²⁰Ne ions
 EXTRACT eff < 90 % 0.5 pA of 150 MeV ²⁰Ne ions
 RESOL ΔE/E 10⁻³ % 0.5 pA of 150 MeV ²⁰Ne ions
 EMITTANCE
 (π mm. mrad) { 5 axial } 0.5 pA of 150 MeV ²⁰Ne ions
6 rad

OPERATING PROGRAMS, time distribution

BASIC NUCLEAR PHYSICS 50% SOLID STATES PHYSICS 30%
 BIOMEDICAL APPLICAT. 1% ISOTOPE PRODUCTIONS 1%
 Atomic Physics 10%
 Accelerator Physics 10%

REFERENCES/NOTES

IEEE Vol. NS-26, No. 2, April 1979
 pages 1872, 2300, 2209, 2355, 2202
 Proceedings of 8th Int.Conf. on Cycl. and their Appl.

PLAN VIEW OF FACILITY, NOTEWORTHY FEATURES, COMMENTS

A project to install an 8 MV tandem as alternate injector has been approved¹⁾. This will make it possible to provide ions of 32 MeV/u up to mass 40. The project is in progress and it is planned to have beams out of the tandem in early 1984.

¹⁾ NIM 184 (1981) 229