

ENTRY NO. 25

NAME OF MACHINE VICKSI
 INSTITUTION HAHN-MEITNER-INSTITUT
 ADDRESS GLIENICKER STR. 100, 1000 Berlin 39 (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 addition of a second injector
 a 8 MV-Tandem, no alterations to the cyclotron
 COST, ACCELERATOR 20 Million DM } +16 MDM Tandem
 COST, FACILITY, total 40 Million DM } Injector
 FUNDED BY FRG (90%) + Berlin (10%)

ACCELERATOR STAFF, OPERATION AND DEVELOPMENT

SCIENTISTS 5 ENGINEERS 7
 TECHNICIANS 17 CRAFTS 16
 GRAD STUDENTS involved during year --
 OPERATED BY Research staff or Operators
 OPERATION 168 hr/wk. On target ~120 hr/wk
 TIME DISTR. in house 70 % outside 30 %
 BUDGET, op & dev 2.6 Million DM
 FUNDED BY FRG (90%) + Berlin (10%)

RESEARCH STAFF, not included above

USERS, in house 50 outside 40
 GRAD STUDENTS involved during year ~15
 RESEARCH BUDGET, in house 2.5 Million DM
 FUNDED BY FRG (90%) + Berlin (10%)

MAGNET

POLE FACE, diameter (compact) -- cm, R-extraction 171 cm
 R injection 43 cm
 GAP, min 6 cm, Field 15.7 kG
 max open cm, Field <1 kG at $9.8 \cdot 10^5$
 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 $2 \cdot 10^{-5}$
 trimming coils 50 max kW: current stability $2 \cdot 10^{-4}$

WEIGHT: Fe 360 tons: coils 6 tons
 COOLING system demineralized 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 $\pm .05/10^6$
 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 $\pm <.05$ deg
 RF POWER input, max 90 kW
 FREQUENCY MODULATION, rate -- /s
 modulator, type --
 beam pulse, width --

VACUUM SYSTEM

OPERATING PRESSURE $1 \cdot 5 \cdot 10^{-7}$ Torr or mbar
 PUMPS, No, Type, Size
 2 Kryopumps 4.2° K with LN2 Baffles
 2 Turbopumps 1450 l/sec

ION SOURCES

- 1) Axial Penning Source in 6 MV Van-de-Graaff
- 2) Sputter Source for 8 MV Tandem Injector
 Stripper between Injectors and Cyclotron

INJECTION SYSTEM

radial, 2 magnetic, 1 electrostatic Inflector

EXTRACTION SYSTEM

Electrostatic Defl., 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, VAX
 OTHER FACILITIES External Pulsing System

CHARACTERISTIC BEAMS

PARTICLE	ENERGY (MeV)		CURRENT (pA)	
	Goal	Achieved	Internal	External
¹² C	50-200	50-384	1-0.1	1-0.1
²⁰ Ne	50-200	50-410	1-0.001	1-0.001
⁴⁰ Ar	50-200	50-530	1-0.001	1-0.001
³² S	200-800	200-800	0.5-0.01	0.5-0.01

SECONDARY (part/s)

BEAM PROPERTIES

MEASURED	CONDITIONS	
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PULSE WIDTH 7.5 RF deg	0.5 pA of 150 MeV	²⁰ Ne ions
PHASE EXC. max ± 3 RF deg	0.5 pA of 150 MeV	²⁰ Ne ions
EXTRACT eff. ~90 %	0.5 pA of 150 MeV	²⁰ Ne ions
RESOL $\Delta E/E$ 10^{-3} %	0.5 pA of 150 MeV	²⁰ Ne ions
EMITTANCE		
(π mm-mrad) 5 axial	0.5 pA of 150 MeV	²⁰ Ne
6 rad		

OPERATING PROGRAMS, time distribution

BASIC NUCLEAR PHYSICS 40% SOLID STATE PHYSICS 30%
 BIOMEDICAL APPL. -- ISOTOPE PRODUCTIONS --
 Atomic Physics 15 %
 Accelerator Physics 15 %

REFERENCES/NOTES

- 1) IEEE Vol.NS-26, No.2, April 79, p.1872, 2300, 2209, 2355, 2202
- 2) Proc.10th Int. Conf. on Cycl. and Appl., 1984, 230

PLAN VIEW OF FACILITY, COMMENTS, ETC.

