

ENTRY No. 27

NAME OF MACHINE VICKSI DATE
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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. alternations to the cyclotron
COST, ACCELERATOR 20 Million DM
COST, FACILITY, total 40 Million DM + 16 MDM Tandem-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 7 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) 171 cm, R extraction 171 cm
R injection 43 cm
GAP, min 6 cm, Field 15.7 kG
max. open 41 cm, Field 4 kG at 9.8 x 10^5
AVERAGE FIELD at R ext 8.9 kG Ampere turns
B max/ <B> 1.74

NUMBER OF SECTORS {compact separated 4} Spiral, max 0 deg

SECTOR ANGLE (SSC) 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 2x10^-5

trimming coils 50 max, kW; current stability 2x10^-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^2/a^2 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 +/- .05/10^5

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 POWER input, max 90 kW

FREQUENCY MODULATION, rate /s

modulator, type

beam pulse, width

VACUUM SYSTEM

OPERATING PRESSURE 1 - 5x10^-7 Torr or mbar

PUMPS, No, Type, Size

2 Cryopumps 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 Injector

EXTRACTION SYSTEM

Electrostatic Defl., Current Septum, Extraction Magnet

FACILITIES FOR RESEARCH

SHIELDED AREA, fixed 800 m^2; movable 77 m^2

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

Table with columns: PARTICLE, ENERGY (MeV) Goal, Achieved, CURRENT (pA) Internal, External. Rows include 12C, 20Ne, 40Ar, 32S.

SECONDARY (part/s)

BEAM PROPERTIES

MEASURED CONDITIONS

PULSE WIDTH .5 RF deg 0.5 pA of 15Q MeV 20Neions

PHASE EXC, max 3 RF deg 0.5 pA of 15Q MeV 20Neions

EXTRACT eff .90% 0.5 pA of 15Q MeV 20Neions

RESOL ΔE/E 10^-3% 0.5 pA of 15Q MeV 20Neions

EMITTANCE

(π mm. mrad) { .5 axial } 0.5 pA of 15Q MeV 20Neions

{ .6 rad }

OPERATING PROGRAMS, time distribution

BASIC NUCLEAR PHYSICS 40% SOLID STATES PHYSICS 30%

BIOMEDICAL APPLICAT. 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, NOTEWORTHY FEATURES, COMMENTS

