

ENTRY NO. 24

NAME OF MACHINE CV 28
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IN CHARGE R. Böttger REPORTED BY R. Böttger

HISTORY AND STATUS

DESIGN, date 1969 Model tests 1972
ENG DESIGN, date 1970
CONSTRUCTION, date 1972-1974
FIRST BEAM, date (or goal) 1973
MAJOR ALTERATIONS Pumping System, New Deflector,
RF-Modulator Power Amplifier, New Main Magnet Coils
COST, ACCELERATOR 3.10^6 DM and Power Supply
COST, FACILITY, total 25.10^6 DM
FUNDED BY Federal Republic of Germany

ACCELERATOR STAFF, OPERATION AND DEVELOPMENT

SCIENTISTS 1 ENGINEERS 1
TECHNICIANS 3 CRAFTS
GRAD STUDENTS involved during year
OPERATED BY Research staff or X Operators
OPERATION 20 hr/wk. On target 20 hr/wk
TIME DISTR. in house 100 % Outside
BUDGET, op & dev
FUNDED BY

RESEARCH STAFF, not included above

USERS, in house 12 outside 5
GRAD STUDENTS involved during year
RESEARCH BUDGET, in house
FUNDED BY

MAGNET

POLE FACE, diameter (compact) 96.5 cm, R extraction 42 cm
R injection cm
GAP, min 5.08 cm, Field 14 kG
min 11.64 cm, Field 21 kG at 2.2.10^5
AVERAGE FIELD at R ext 17.4 kG Ampere turns
B max / < B >

NUMBER OF SECTORS { compact 3 } Spiral, max deg
{ separated }
SECTOR ANGLE (SSC) deg
TRIMMING COILS

CONDUCTOR, material and type
STORED ENERGY (cryogenic) MJ
POWER: main coils 85 max, kW; current stability 10^-5
trimming coils 6 max, kW; current stability 10^-5
WEIGHT: Fe 20 tons; coils 2 tons
COOLING system Distilled Water
ION ENERGY (bending limit) E/A = 28 q^2/a^2 MEV/amu
(focusing limit) E/A = 28 q/a MEV/amu

ACCELERATION SYSTEM

DEES, number 2, angle 90 deg
BEAM APERTURE 3 cm; DC Bias 0.4 kV
TUNED by, coarse MSP, fine VC
RF 6.5 to 26.2 MHz, stable +/- 10^-5
Orb F 6.5 to 26.2 MHz
HARMONICS, RF/Orb F, used Fundamental
DEE-Gnd, max 35 kV, min gap cm
STABILITY, (pk-pk noise)/(pk RF volt) 5.10^-4
ENERGY GAIN, max 120 kV/turn
RF PHASE, stable to +/- 3 deg
RF POWER input, max 75 kW
FREQUENCY MODULATION, rate /s
modulator, type Internal Pulsing System
beam pulse, width < 1 ns (fwhm)

VACUUM SYSTEM

OPERATING PRESSURE 2.10^-5 Torr mbar
PUMPS, No, Type, Size 2 Turbomolecular and
1 Cryo.-Pumps

ION SOURCES

"Cold Cathode" Penning or Thermionic Mode

MSP - Movable Shorting Plane
VC - Variable Capacitor

INJECTION SYSTEM

EXTRACTION SYSTEM

DC electrostatic with magnetic channel
FACILITIES FOR RESEARCH 625+
SHIELDED AREA, fixed 225 m^2, movable 1 m^2
TARGET STATIONS 5 in 2 rooms
STATIONS served at same time, max
MAG SPECTROGRAPH, type
COMPUTER model 2 PDP 11/34; 2 ISI 11/23
OTHER FACILITIES Time of Flight Facility for Fast Neutrons;
Standard Neutron Field for Therapy and Radiobiology

CHARACTERISTIC BEAMS

Table with columns: PARTICLE, ENERGY (MeV) Goal, Achieved, CURRENT (pA) Internal, External. Rows include p, d, He, He.

BEAM PROPERTIES

MEASURED CONDITIONS
PULSE WIDTH 6 RF deg 1 pA of 10 MeV p ions
PHASE EXC. max RF deg 1 pA of 10 MeV d ions
EXTRACT eff 70 % pA of MeV ions
RESOL DELTA E/E 0.3 % pA of MeV ions
EMITTANCE { 7 axial } 10 pA of 10 MeV d
{ 10 rad }

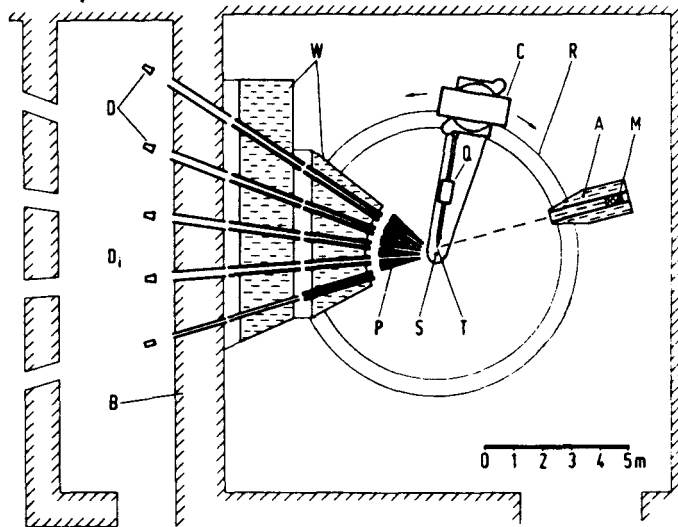
OPERATING PROGRAMS, time distribution

BASIC NUCLEAR PHYSICS SOLID STATES PHYSICS
BIOMEDICAL APPLICAT ISOTOPE PRODUCTIONS
Neutron Production for Scattering Experiments
Dosimetry for Fast Neutrons

REFERENCES/NOTES

- 1) Nucl. Instr. Meth., 169 (1980) 349 - 358
2) IAEA-AG-371/14, 203 - 215

PLAN VIEW OF FACILITY, COMMENTS



- 1.) R. Böttger et al, "A Multi-Angle Time-of-Flight Spectrometer for Fast Neutron Scattering Experiments", Proc. on Nuclear Data for Science and Technology, Antwerp, Belgium, 1982,
2.) Nucl. Instr. Meth., 193 (1982) 635 - 644