

ENTRY No. 28

NAME OF MACHINE Bonn Isochr. Cyclotron DATE June 89
INSTITUTION University of Bonn, Inst. f. Strahlen- und Kernphysik
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IN CHARGE T. Mayer-Kuckuk REPORTED BY H. Wahl

HISTORY AND STATUS

DESIGN, date 1965 Model tests 1966-67
ENG DESIGN, date 1966-67
CONSTRUCTION, date 1967-69
FIRST BEAM, date (or goal) Dec. 1968
MAJOR ALTERATIONS none

COST, ACCELERATOR 5.000.000 DM
COST, FACILITY, total 8.000.000 DM
FUNDED BY BMFT

ACCELERATOR STAFF, OPERATION AND DEVELOPMENT

SCIENTISTS 1 ENGINEERS 3
TECHNICIANS 5 CRAFTS 2
GRAD STUDENTS involved during year 3
OPERATED BY Research staff or 5 Operators
OPERATION 120 hr/wk, On target 110 hr/wk
TIME DISTR. in house 98 %, Outside 2 %
BUDGET, op & dev 1.900.000 DM
FUNDED BY Land NRW

RESEARCH STAFF, not included above
USERS, in house 80 outside 5
GRAD STUDENTS involved during year 50
RESEARCH BUDGET, in house 600.000 DM
FUNDED BY Land NRW and BMFT

MAGNET

POLE FACE, diameter (compact) 200 cm, R extraction 90 cm
R injection cm
GAP, min 8,4 cm, Field 1,8, 5 kG
max 24,0 cm, Field 7,0 kG
AVERAGE FIELD at R ext 1,2, 7 kG
B max/ <B> 1,1, 46
NUMBER OF SECTORS compact 3 separated 3 Spiral, max 0 deg
SECTOR ANGLE (SSC) deg
TRIMMING COILS 7/sector

CONDUCTOR, material and type copper
STORED ENERGY (cryogenic) MJ
POWER: main coils 40 max, kW; current stability 10-5
trimming coils 8 max, kW; current stability 10-3
WEIGHT: Fe 200 tons; coils 8 tons
COOLING system demineralized water
ION ENERGY (bending limit) E/A = 60 q^2/a^2 MeV/amu
(focusing limit) E/A = 30 q^2/a^2 MeV/amu

ACCELERATION SYSTEM

DEES, number 3; angle 40 deg
BEAM APERTURE 2,4 cm; DC Bias 0 kV
TUNED by, coarse capacity fine loops 5
RF 20 to 29 MHz, stable +/- 10-5
Orb F 6,67 to 9,67 MHz
HARMONICS, RF/Orb F, used 3
DEE - Gnd, max 45 kV, min gap 2,3 cm
STABILITY, (pk-pk noise)/(pk RF volt) 10-4
ENERGY GAIN, max 200 kV/turn
RF PHASE, stable to +/- 2 deg
RF POWER input, max 30 kW
FREQUENCY MODULATION, rate /s
modulator, type
beam pulse, width

VACUUM SYSTEM

OPERATING PRESSURE 2 x 10^-6 Torr or mbar
PUMPS, No, Type, Size diffusion pump

ION SOURCES

ECR-IS and atomic beam-IS for polarized p, d

INJECTION SYSTEM

axial hyperbloid inflector

EXTRACTION SYSTEM

electrostatic deflector and 2 magn. channels

FACILITIES FOR RESEARCH

SHIELDED AREA, fixed 415 m^2; movable m^2
TARGET STATIONS 12 in 4 rooms
STATIONS served at same time, max 1
MAG SPECTROGRAPH, type split pole
COMPUTER model VAX 11/750
OTHER FACILITIES 3 orange spectrometers
off. line mass separator

CHARACTERISTIC BEAMS

Table with columns: PARTICLE, ENERGY (MeV) Goal, Achieved, CURRENT (pA) Internal, External. Rows include C4+, C5+, N5+, and SECONDARY.

BEAM PROPERTIES

MEASURED CONDITIONS
PULSE WIDTH 5 RF deg 1 pA of 25 MeV d ions
PHASE EXC, max RF deg pA of MeV ions
EXTRACT eff 80 % 10 pA of 28 MeV d ions
RESOL DE/E 0,1 % 5 pA of 25 MeV d ions
EMITTANCE (pi mm. mrad) { 10 axial } 10 pA of 25 MeV d ions
{ 10 rad }

OPERATING PROGRAMS, time distribution
BASIC NUCLEAR PHYSICS 40% SOLID STATES PHYSICS 36%
BIOMEDICAL APPLICAT. 7% ISOTOPE PRODUCTIONS 8%
archeometric applications 4%
development 12%

REFERENCES/NOTES

Nucl. Instr. 130 (1975) 335
Ann. Reports of the Inst. f. Strahlen und Kernphysik

PLAN VIEW OF FACILITY, NOTEWORTHY FEATURES, COMMENTS

