

ENTRY No. 98

NAME OF MACHINE W.U. Sector Focused Cyclotron DATE 7/15/81
INSTITUTION Washington University
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IN CHARGE John T. Hood REPORTED BY John T. Hood

HISTORY AND STATUS

DESIGN, date 1960 Model tests 1961-62
ENG DESIGN, date 1961-63
CONSTRUCTION, date 1962-65
FIRST BEAM, date (or goal) 1965
MAJOR ALTERATIONS none

COST, ACCELERATOR

COST, FACILITY, total
FUNDED BY AFOSR, NSF

ACCELERATOR STAFF, OPERATION AND DEVELOPMENT

SCIENTISTS ENGINEERS 1
TECHNICIANS CRAFTS 1
GRAD STUDENTS involved during year
OPERATED BY Research staff or X Operators
OPERATION 12 hr/wk, On target 10 hr/wk
TIME DISTR. in house %, Outside %

BUDGET, op & dev
FUNDED BY Washington University

RESEARCH STAFF, not included above
USERS, in house 4 outside 1
GRAD STUDENTS involved during year 6
RESEARCH BUDGET, in house
FUNDED BY

MAGNET

POLE FACE, diameter (compact) 137. cm, R extraction 54.5 cm
R injection cm
GAP, min 14.8 cm, Field 17.8 kG
max 33.8 cm, Field 10.3 kG } at 46 x 10^6
AVERAGE FIELD at R ext 14 kG } Ampere turns
B max/ < B >

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

TRIMMING COILS 5 pairs radial
4 pairs/sector first harmonic
CONDUCTOR, material and type copper strap

STORED ENERGY (cryogenic) MJ
POWER: main coils 120 max, kW; current stability
trimming coils 60 max, kW; current stability

WEIGHT: Fe 82 tons; coils 12 tons
COOLING system oil
ION ENERGY (bending limit) E/A = q^2/a^2 MeV/amu
(focusing limit) E/A = q/a MeV/amu

ACCELERATION SYSTEM

DEES, number 1; angle 180 deg
BEAM APERTURE 3.2 cm; DC Bias 0 kV
TUNED by, coarse MS fine VC, Auto
RF 7 to 16 mHz, stable +/-
Orb F 7 to 16 mHz
HARMONICS, RF/Orb F, used
DEE - Gnd, max 60 kV, min gap 1 cm
STABILITY, (pk-pk noise)/(pk RF volt)
ENERGY GAIN, max kV/turn
RF PHASE, stable to +/- deg
RF POWER input, max 100 kW
FREQUENCY MODULATION, rate /s
modulator, type
beam pulse, width

VACUUM SYSTEM

OPERATING PRESSURE 20 u Torr or mbar
PUMPS, No, Type, Size 2 oil diffusion
Twenty and seven inch

ION SOURCES

Penning, Hot Filament

INJECTION SYSTEM

EXTRACTION SYSTEM

Electrostatic and Magnetic Channel

FACILITIES FOR RESEARCH

SHIELDED AREA, fixed 100 m^2; movable m^2
TARGET STATIONS 6 in 2 rooms
STATIONS served at same time, max 1
MAG SPECTROGRAPH, type
COMPUTER model
OTHER FACILITIES

CHARACTERISTIC BEAMS

Table with columns: PARTICLE, ENERGY (MeV) Goal, Achieved, CURRENT (pμA) Internal, External. Rows include alpha, 3He, p, d.

BEAM PROPERTIES

MEASURED CONDITIONS
PULSE WIDTH RF deg pμ A of MeV ions
PHASE EXC, max RF deg pμ A of MeV ions
EXTRACT eff % pμ A of MeV ions
RESOL ΔE/E % pμ A of MeV ions
EMITTANCE
(π mm. mrad) { axial } pμA of MeV ions
{ rad }

OPERATING PROGRAMS, time distribution
BASIC NUCLEAR PHYSICS 60% SOLID STATES PHYSICS
BIOMEDICAL APPLICAT. 20% ISOTOPE PRODUCTIONS 20%

REFERENCES/NOTES

PLAN VIEW OF FACILITY, NOTEWORTHY FEATURES, COMMENTS