

ENTRY No. 121

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
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 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 deg
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^2/a^2 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 (pA) Internal, External. Rows for alpha, He, p, d.

BEAM PROPERTIES

MEASURED CONDITIONS
PULSE WIDTH RF deg uA of MeV ions
PHASE EXC, max RF deg uA of MeV ions
EXTRACT eff % uA of MeV ions
RESOL Delta E/E % uA of MeV ions
EMITTANCE
(pi mm. mrad) {axial} uA of MeV ions

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