

ENTRY NO. C69 Date June 26, 1992
 Name of Machine Oak Ridge Isochronous Cyclotron
 Institution Oak Ridge National Laboratory
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HISTORY
 MILESTONE DATES:
 Design 1958 Model Tests 1958-59
 Construction 1958-1962 First Beam 1963
 DESIGN/CONSTRUCTION BY:
 in house X other
 COST: Accelerator \$ 2.3 M Facility \$ 24 M
 FUNDED BY: US Department of Energy

STATUS
 STAFF: Machine
 Scientists 1 Engineers 3
 Technicians 4 Students
 Research (in house/external)
 Scientists / Engineers /
 Technicians / Students /
 BUDGET: Machine Funded by
 Research Funded by
 TIME DISTRIBUTION:
 Basic Research (in house/external) % / %
 Applied Program (in house/external) % / %
 Development % Maintenance %

MAGNET
 POLE PARAMETERS:
 Diameter 193 cm R_{extract} 77 cm R_{inject} 2.37 cm
 HILL PARAMETERS: Gap (min) 19 cm B_{max} 1.40 T
 (0.6 x 10¹² AT) Gap (max) 71 cm B_{min} 1.40 T
 VALLEY PARAMETERS: Gap (min) cm B_{max} T
 (0 AT) Gap (max) cm B_{min} 1.92 T
 AVERAGE FIELD: < B >_{min} T < B >_{max} T
 NUMBER OF SECTORS: compact/separated 3 /
 sector angle deg. spiral (max) 30. deg.
 FIELD TRIMMING: Trim Coils 10 pairs
 Harmonic Coils 4 pairs per valley
 Other
 CURRENT: Main Coils 5000 Amps Stability 2*10⁻⁴
 Trim Coils 800 Amps Stability 2*10⁻⁴
 Stored Energy (cryogenic) MJ
 WEIGHT: Iron 1.8*10³ kg Conductor 8.2*10³ kg
 ION ENERGY: Bending Limit E/A = 100. q²/A² MeV/u
 Focussing Limit E/A = 75. q/A MeV/u

ACCELERATION SYSTEM
 FUNDAMENTAL ACCELERATION:
 Description: Single 180 degree dee
 No. of Gaps/turn 2 dE/dn(max) 0.16 MeV/q
 Voltage(max) 0.08 MV Harmonic f_r/f_{ion} 1
 Freq 6.7-7.0-20.1 MHz Power in(max) 0.20 MW
 Stability: Phase 1 degree Voltage
 OTHER CAVITIES (Flattopping or otherwise):
 Description:
 Region of Influence: R_{min} cm R_{max} cm
 No. of Gaps/turn dE/dn(max) MeV/q
 Voltage(max) MV Harmonic f_r/f_{ion}
 Freq MHz Power in(max) MW
 Stability: Phase Voltage

VACUUM SYSTEM
 OPERATING PRESSURE: 1*10⁻⁶ TORR
 PUMPS: No. and type
 1 / 50 cm oil diffusion pumps 1/50cm cryopump

ION SOURCE(S)
 Type Intensity (mA) $\epsilon_n = \beta\gamma\epsilon$ (mm mrad) Ion Species
 (a) Penning (Internal) H⁺
 (b) H⁺
 (c) He⁺
 (d) 25 MV electrostatic tandem

INJECTION SYSTEM
 Radial with foil stripping Efficiency %
EXTRACTION SYSTEM
 Electrostatic+2 magnetic channels Efficiency 65 %

CHARACTERISTIC BEAMS

Accelerated Ions	E/A (MeV/u)	Current(part μ A)	
		Internal	External
(a) H	50		50 μ A
(b) Ni	17.4		0.03
(c) Sn	7.9		0.002
(d) Gd	5.6		0.001
Secondary Particles	E (MeV)	part/sec	
(a)			
(b)			
(c)			

EXTRACTED BEAM PROPERTIES:
 For μ A of MeV/u ions
 $\Delta E/E$ % $\Delta\phi$ °rf
 $\epsilon_n = \beta\gamma\epsilon$ x π mm mrad z π mm mrad

FACILITIES FOR RESEARCH
 SHIELDED AREA: Fixed m² Moveable m²
 Target Stations: No. Served At Same Time:
 MAGNETIC SPECTROMETERS:
 OTHER FACILITIES:

REFERENCES/NOTES
 (a) Paper R3 in the proceedings of this conference
 (b)

PLAN VIEW OF FACILITY, COMMENTS
 Facility is beginning a 3 year reconfiguration program where the cyclotron will serve as the primary beam generator for the production of radioactive beams which will be accelerated in the HHIRF electrostatic tandem.