

ENTRY NO: C45
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Machine Name: Indiana University Cyclotron Facility
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History

Designed by: IUCF staff with various vendors
Construction Dates: 1968-1975
First Beam Date: September 1975

Characteristic Beams

ions / energy(MeV/N)/current(pps)/power(w)
H+ 205 3x10¹³ 1000

Transmission Efficiency (source to extracted beam)

Typical (%): 20
Best (%): 25

Emittance

Emittance Definition: RMS
Vertical (pi mm mrad): 1.5
Horizontal (pi mm mrad): 1.5
Longitudinal (dE/E[%] x RF[deg.]): 0.1%, 4

USES

Basic Research (%): 5
Development (%): 5
Therapy (%): 80
Isotope Production (%):
Other Application (%): 10
Maintenance (%):
Beam Tuning (%): 5
Total Time (h/year): 2000

TECHNICAL DATA

(a)Magnet

Type: Separated sector
Kb (MeV): 215
Kf (MeV): 215
Average Field (min./max. T): 0.64 (<0.02 ÷ 1.65)
Number of Sectors: 4
Hill Angular Width (deg.): 36
Spiral (deg.): N/A
Pole Diameter (m): N/A
Injection Radius (m): 1.01
Extraction Radius (m): 3.3
Hill Gap (m): 0.76
Valley Gap (m):
Trim Coils
Number: 21x2
Maximum Current (A-turns): 950
Harmonic Coils
Number: 4xNsectorsx2
Maximum Current (A-turns): 40
Main Coils
Number: 1x2
Total Ampere Turns: 40,000
Maximum Current (A): 1000
Stored Energy (MJ): N/A
Total Iron Weight (tons): 2200
Total Coil Weight (tons): 10
Power
Main Coils (total KW): 250
Trim Coils (total, maximum, KW): 100
Refrigerator (cryogenic, KW): N/A

(b)RF

Acceleration

Frequency Range (MHz): 35.58
Harmonic Modes: 4
Number of Dees: 2

Number of Cavities: 2

Dee Angular Width (deg.):38

Voltage

At Injection (peak to ground, KV): 200
At Extraction (peak to ground, KV): 200
Peak (peak to ground, KV): 200
Line Power (max, KW): 200
Phase Stability (deg.): 0.25
Voltage Stability (%): 8x10⁻⁵

(c)Injection

Ion Source: ECR
Source Bias Voltage (kV): 600
External Injection: radial
Buncher Type: RF
Injection Energy (MeV/n): 0.75
Component: electrostatic inflector
Injection Efficiency (%): 75
Injector: RFQ

(d)Extraction

Elements, Characteristic:
electrostatic septum-70KV magnetic deflector
Typical Efficiency (%): 99
Best Efficiency (%): 99

(e)Vacuum

Pumps: 4 cryogenic, 2 diffusion
Achieved Vacuum (Pa): 0.0004

REFERENCES 1995 IUCF Scientific and Technical Report
IUCF Status Report, R.E. Pollock,IEEE Trans.Nucl. Sci. NS-26

EXPERIMENTAL FACILITIES

None

COMMENTS