ENTRY NO:C05
Date: 10 Feb 2005 13:26:50
Machine Name: HIRFL main cyclotron-SSC
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History
Designed by: Accelerator group of IMP, Lanzhou
Construction Dates: 1978-1988
First Beam Date: Dec. 1988
Characteristic Beams

12C	80 (MeV/n)	4.2e11 (pps)	64 (w)
22Ne	70 (MeV/n)	2.0e11 (pps)	46 (w)
36Ar	69 (MeV/n)	1.1e11 (pps)	45 (w)
136Xe	15 (MeV/n)	2e09 (pps)	1 (w)

Transmission Efficiency (source to extracted beam)
Typical (%): 10
Best (%): 20
Emittance
Emittance Definition: 50%
Vertical (pi mm mrad): 10
Horizontal (pi mm mrad): 10
Longitudinal (dE/E[%] x RF[deg.]): 0.2 (%) * 40 (deg.)
USES
Basic Research (%): 55
Development (%): 10
Therapy (%):
Isotope Production (%):
Other Application (%): 15
Maintenance (%): 10
Beam Tuning (%): 10
Total Time (h/year): 4000

TECHNICAL DATA
(a)Magnet
Type: separated sector
Kb (MeV): 450
Kf (MeV): 230
Average Field (min./max. T): 1.6 T max
Number of Sectors: 4
Hill Angular Width (deg.): 52
Spiral (deg.):
Pole Diameter (m): 7.17
Injection Radius (m): 1.0
Extraction Radius (m): 3.21
Hill Gap (m): 0.1
Valley Gap (m):
Trim Coils
Number: 36 (/sector)
Maximum Current (A): 600
Harmonic Coils
Number: 12 (/sector)
Maximum Current (A): 300
Main Coils
Number: 1 (/sector)
Total Ampere Turns: 345600
Maximum Current (A): 3600
Stored Energy (MJ):
Total Iron Weight (tons): 2000
Total Coil Weight (tons): 16
Power
Main Coils (total KW): 600
Trim Coils (total, maximum, KW): 150
Refrigerator (cryogenic, KW):

(b)RF
Acceleration
Frequency Range (MHz): 6.5 - 14.0
Harmonic Modes: 2,4,6
Number of Dees: 2
Number of Cavities: 2
Dee Angular Width (deg.): 30
Voltage
At Injection (peak to ground, KV): 150 Max
At Extraction (peak to ground, KV): 170 Max
Peak (peak to ground, KV): 170 Max
Line Power (max, KW): 60
Phase Stability (deg.): +/- 0.3
Voltage Stability (%): 0.1

(c)Injection
Ion Source:
Source Bias Voltage (kV):
External Injection:
Buncher (type) :
Injection Energy (MeV/n):
Component:
Injection Efficiency (%): 30 - 40
Injector: HIRFL SFC as an injector

(d)Extraction
Elements, Characteristic: Bump channel, electrostatic deflector, magnetic channels, two bending magnets
Typical Efficiency (%): 35 - 45
Best Efficiency (%): 70

(e)Vacuum
Pumps: Cryogenic pump
Achieved Vacuum (Pa): 2e-5 Pa

REFERENCES F. Ye et al. 13th ICCTA, p78

EXPERIMENTAL FACILITIES
There are 6 experimental setups.

COMMENTS