ENTRY NO: C37
Date: 16 Feb 2005 14:33:59
Machine Name: iThemba LABS Injector Cyclotron 1
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History
Designed by: National Accelerator staff
Construction Dates: 1978 - 1983
First Beam Date: December 1983
Characteristic Beams
ions / energy(MeV/N)/current(pps)/power(w)

p	3.15	2.1e15	1017
p	8.0	8.2e13	104
d	1.9	1.9e13	5.7
He	2.5	9.3e12	8

Transmission Efficiency (source to extracted beam)
Typical (%):
Best (%):
Emittance
Emittance Definition: RMS
Vertical (pi mm mrad): 10
Horizontal (pi mm mrad): 15
Longitudinal (dE/E[%] x RF[deg.]): 0.042
USES
Basic Research (%): 10
Development (%): 0
Therapy (%): 35
Isotope Production (%): 40
Other Application (%):
Maintenance (%): 3
Beam Tuning (%): 12
Total Time (h/year): 7000

TECHNICAL DATA
(a)Magnet
Type: sector magnets
Kb (MeV): 8
Kf (MeV): 8
Average Field (min./max. T): 0.3-1.0
Number of Sectors: 4
Hill Angular Width (deg.): 45
Spiral (deg.):
Pole Diameter (m): 1.16
Injection Radius (m):
Extraction Radius (m): 0.476
Hill Gap (m): 0.156
Valley Gap (m): 0.250
Trim Coils
Number: 5x2
Maximum Current (A-turns): 180
Harmonic Coils
Number: 2xNsectorsx2
Maximum Current (A-turns): 20
Main Coils
Number: 1x2
Total Ampere Turns: 154560
Maximum Current (A): 690
Stored Energy (MJ): 0.1
Total Iron Weight (tons): 54.5
Total Coil Weight (tons): 1.85
Power
Main Coils (total KW): 46
Trim Coils (total, maximum, KW): 9
Refrigerator (cryogenic, KW):

(b)RF
Acceleration
Frequency Range (MHz): 8.6 - 26
Harmonic Modes: 2 and 6
Number of Dees: 2
Number of Cavities: 4
Dee Angular Width (deg.):90
Voltage
At Injection (peak to ground, KV):
At Extraction (peak to ground, KV):
Peak (peak to ground, KV): 60
Line Power (max, KW): 2x 25
Phase Stability (deg.): 0.1
Voltage Stability (%): 0.1

(c)Injection
Ion Source: PIG
Source Bias Voltage (kV):
External Injection:
Buncher Type:
Injection Energy (MeV/n):
Component:
Injection Efficiency (%):
Injector:

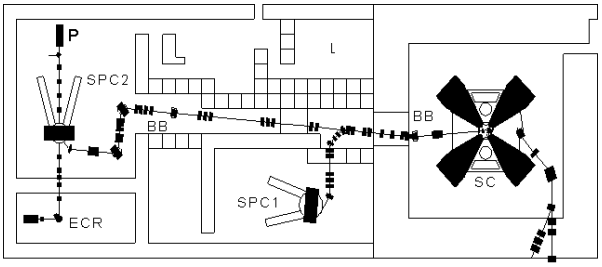
(d)Extraction
Elements, Characteristic: electrostatic channel, 2 x magnetic channels
Typical Efficiency (%): 75
Best Efficiency (%): 96

(e)Vacuum
Pumps: turbo 4.8 cub m/s, roots 350 cub m/h and rotary vanes
Achieved Vacuum (Pa): 1.5e-3

REFERENCES Proc. 10th Int. Conf. on Cyclotrons (1984) 67, 94, 373 Proc. 11th Int. Conf. on Cyclotrons (1986) 9, 109

EXPERIMENTAL FACILITIES

COMMENTS



BB Beamline buncher
ECR ECR ion source (basement)
L Low energy experimental area
P Polarized ion source (basement)
SPC1 Solid pole injector for light ions
SPC2 Solid pole injector for heavy or polarized ions
SC Separated-sector cyclotron