ENTRY NO:FM02
Date: 1 Apr 2005 17:00:00
Machine Name: Synchrocyclotron on 1 GeV
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History
Designed by: Efremov Institute
Construction Dates: 1959-1965
First Beam Date: November 1967
Characteristic Beams

p+,	1000 MeV,		6*10^12 pps
p+,	1000 MeV,	dE/E=10^(-3)[%],	10^10 pps
pi+,	450 MeV/c,	dp/p=6[%],	10^6 pps mkA
pi-,	450 MeV/c,	dp/p=6[%],	3*10^5 pps mkA
pi-,	250 MeV/c,	dp/p=2.5-12[%],	10^- 5*10^6 pps mkA
mu+,	29 MeV/c,	dp/p=12[%],	3*10^4 pps mkA
mu-,	160 MeV/c,	dp/p=10[%],	9*10^4 pps mkA
mu+,	175 MeV/c,	dp/p=10[%],	3*10^5 pps mkA

Transmission Efficiency (source to extracted beam)
Typical (%):
Best (%):
Emittance
Emittance Definition:
Vertical (pi mm mrad):
Horizontal (pi mm mrad):
Longitudinal (dE/E[%] x RF[deg.]):
USES
Basic Research (%):
Development (%):
Therapy (%): 10
Isotope Production (%):
Other Application (%):
Maintenance (%):
Beam Tuning (%):
Total Time (h/year): 2000

TECHNICAL DATA
(a)Magnet
Type: E9
Kb (MeV):
Kf (MeV):
Average Field (min./max. T): 1.9
Number of Sectors:
Hill Angular Width (deg.):
Spiral (deg.):
Pole Diameter (m): 6.85
Injection Radius (m):
Extraction Radius (m): 3.15
Hill Gap (m):
Valley Gap (m):
Trim Coils
Number:
Maximum Current (A-turns):
Harmonic Coils
Number:
Maximum Current (A-turns):
Main Coils
Number: 132*2
Total Ampere Turns: 1.3*10^6
Maximum Current (A): 4800
Stored Energy (MJ):
Total Iron Weight (tons): 7800
Total Coil Weight (tons): 120
Power
Main Coils (total KW): 1000
Trim Coils (total, maximum, KW): 20
Refrigerator (cryogenic, KW):

(b)RF
Acceleration
Frequency Range (MHz): 29-13.3
Harmonic Modes: 1
Number of Dees: 1
Number of Cavities:
Dee Angular Width (deg.): 180
Voltage
At Injection (peak to ground, KV): 10
At Extraction (peak to ground, KV):
Peak (peak to ground, KV):
Line Power (max, KW):
Phase Stability (deg.):
Voltage Stability (%):

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

(d)Extraction
Elements, Characteristic:
Typical Efficiency (%): 30
Best Efficiency (%):

(e)Vacuum
Pumps: 2 -> 2*10^4 l/s
3 -> 4*10^3 l/s
Achieved Vacuum (Pa): 2.7*10^(-4)

REFERENCES N.K.Abrossimov et al. Proc. VII All-Union Conf. on Part. Acc., Moscow, 1981, v.2, p.75-78

EXPERIMENTAL FACILITIES

COMMENTS