

ENTRY NO: C24
Date: 28 Feb 2005 09:57:42
Machine Name: RIKEN RING CYCLOTRON
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History

Designed by: RIKEN
Construction Dates: 1980-1986
First Beam Date: Dec 16, 1986

Characteristic Beams

ions / energy(MeV/n)/current(pps)/power(w)			
p	210	2e11	60
d,12C,20Ne	135	1-3e12	
40Ar	95	4e11	300
40Ar	24	1.3e13	2000
136Xe	26	6e11	350

Transmission Efficiency (source to extracted beam)

Typical (%) : 70
Best (%) : 90

Emittance

Emittance Definition: RMS
Vertical (pi mm mrad): 0.7
Horizontal (pi mm mrad): 0.7
Longitudinal (dE/E[%] x RF[deg.]):

USES

Basic Research (%) : 51
Development (%) : 4
Therapy (%) :
Isotope Production (%) :
Other Application (%) :
Maintenance (%) : 24
Beam Tuning (%) : 21
Total Time (h/year): 6730

TECHNICAL DATA

(a)Magnet

Type: straight sector
Kb (MeV): $540q^{*2}/A^{*2}$
Kf (MeV):
Average Field (min./max. T): 0.97
Number of Sectors: 4
Hill Angular Width (deg.): 50
Spiral (deg.):
Pole Diameter (m):
Injection Radius (m): 0.89
Extraction Radius (m): 3.56
Hill Gap (m): 0.08
Valley Gap (m):
Trim Coils
Number: 26*4x2
Maximum Current (A-turns): 230-600

Harmonic Coils

Number: xNsectorsx2
Maximum Current (A-turns):

Main Coils

Number: 4x2
Total Ampere Turns: 128000
Maximum Current (A): 1072

Stored Energy (MJ):

Total Iron Weight (tons): 2100

Total Coil Weight (tons): 16

Power

Main Coils (total KW):
Trim Coils (total, maximum, KW):
Refrigerator (cryogenic, KW):

(b)RF

Acceleration

Frequency Range (MHz): 18-45
Harmonic Modes: 5,9,10,11

Number of Dees: 2

Number of Cavities: 2

Dee Angular Width (deg.):23.5

Voltage

At Injection (peak to ground, KV):
At Extraction (peak to ground, KV):

Peak (peak to ground, KV): 300

Line Power (max, KW): 300*2

Phase Stability (deg.): +0.2

Voltage Stability (%): +-0.015

(c)Injection

Ion Source:

Source Bias Voltage (kV):

External Injection: radial

Buncher Type:

Injection Energy (MeV/n): 0.5-7

Component: magnetic channel, electrostatic channel

Injection Efficiency (%): 70

Injector: 715 cyclotron, heavy ion linac

(d)Extraction

Elements, Characteristic: electrostatic channel magnetic channel efficiency

Typical Efficiency (%): 80

Best Efficiency (%): 100

(e)Vacuum

Pumps: 5000l/s(cryogenic)*4,10000l/s(cryogenic)*10

Achieved Vacuum (Pa): 8e-11

REFERENCES Y.Yano Proc. 13th Int. Cyclo. Conf. (1992)p.102.

EXPERIMENTAL FACILITIES

14 target stations: projectile fragment separator (RIPS) QQD-QD spectrometer (SMART)

