

ENTRY NO: C31
Date: 3 Feb 2005 18:21:18
Machine Name: U-400M
Institution: FLNR JINR
Address: 141980 Moscow region, Dubna, Joliot Curie 6, Russi
Telephone: +7 (09621) 62261
Fax: +7 (09621) 65083
Web Address: www.jinr.ru
Person in Charge of Cyclotron: Yu. Ts. Oganessian
Person Reporting Information: G. G. Gulbekian
E-mail Address: post@flnr.jinr.ru

History

Designed by: FLNR JINR
Construction Dates: 1987-1990
First Beam Date: 1991

Characteristic Beams

ions / energy(MeV/N)/current(pps)/power(w)		
7Li2+	35	6*10 E13
11B3+	32	4*10 E13
12C4+	47	4*10 E13
18O5+	33	2.5*10 E13
36S10+	33	6*10 E11
40Ar12+	40	7*10 E11

Transmission Efficiency (source to extracted beam)

Typical (%): 20

Best (%):

Emittance

Emittance Definition:

Vertical (pi mm mrad): 17

Horizontal (pi mm mrad): 50

Longitudinal (dE/E[%] x RF[deg.]): 0.5%

USES

Basic Research (%): 60

Development (%): 20

Therapy (%):

Isotope Production (%):

Other Application (%):

Maintenance (%): 10

Beam Tuning (%): 10

Total Time (h/year): 3000

TECHNICAL DATA

(a)Magnet

Type: compact

Kb (MeV):

Kf (MeV):

Average Field (min./max. T): 1.95

Number of Sectors: 4

Hill Angular Width (deg.): 45

Spiral (deg.): 40 deg

Pole Diameter (m): 4

Injection Radius (m):

Extraction Radius (m): 1.75

Hill Gap (m): 0.1

Valley Gap (m): 0.5

Trim Coils

Number: 15x2

Maximum Current (A-turns):

Harmonic Coils

Number: 5xNsectorsx2

Maximum Current (A-turns):

Main Coils

Number: 1x2

Total Ampere Turns: 1.26*10⁶

Maximum Current (A): 2500

Stored Energy (MJ):

Total Iron Weight (tons): 2100

Total Coil Weight (tons): 115

Power

Main Coils (total KW): 750

Trim Coils (total, maximum, KW): 120

Refrigerator (cryogenic, KW):

(b)RF

Acceleration

Frequency Range (MHz): 15 - 25

Harmonic Modes: 2;4

Number of Dees: 4

Number of Cavities: 4

Dee Angular Width (deg.):

Voltage

At Injection (peak to ground, KV):

At Extraction (peak to ground, KV):

Peak (peak to ground, KV): 150

Line Power (max, KW): 4x100

Phase Stability (deg.):

Voltage Stability (%): 0.1

(c)Injection

Ion Source: ECR DECRIS14-2

Source Bias Voltage (kV):

External Injection: axial

Buncher Type: sine

Injection Energy (MeV/n):

Component:

Injection Efficiency (%): 20

Injector:

(d)Extraction

Elements, Characteristic: Stripping foil efficiency

Typical Efficiency (%): 70

Best Efficiency (%):

(e)Vacuum

Pumps: 6 oil pumps with nitrogen traps

Achieved Vacuum (Pa): 4*10⁻⁵

REFERENCES 1. Entry NC44 in Proc. of the 13th Int. Conf., Cyclotrons and Their Application, Vancouver, 1992, p.822 2. B.Gikal, G.Gulbekian, V.Kutner in Proc. of Int. Conf., Cyclotrons and Their Application, Caen, 1998, pp. 587-591

EXPERIMENTAL FACILITIES

COMBAS, FOBOS, ACCULINNA

COMMENTS