

ENTRY NO:C35

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Machine Name: R-7 (120- cm cyclotron)

Institution: SINP MSU

Address: SINP MSU, MOSCOW, RUSSIA

Telephone: (095)9393686

Fax: (095)9390896

Web Address: <http://www.sinp.msu.ru/>

Person in Charge of Cyclotron: Kir' jnov E.

Person Reporting Information: Kir' jnov E.

E-mail Address: info@sinp.msu.su

History

Designed by: NIEFA, Leningrad, Russia

Construction Dates: 1953-1958

First Beam Date: 05.01.59

Characteristic Beams

p, d, 3He, 4He

5-7.5 MeV/nucl

10-20 microA

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 (%): 40

Development (%):

Therapy (%):

Isotope Production (%): 20

Other Application (%): 20

Maintenance (%): 10

Beam Tuning (%): 10

Total Time (h/year): 2000

TECHNICAL DATA

(a)Magnet

Type: compact

Kb (MeV):

Kf (MeV):

Average Field (min./max. T): 0.55-1.47T

Number of Sectors:

Hill Angular Width (deg.):

Spiral (deg.):

Pole Diameter (m): 1.2

Injection Radius (m):

Extraction Radius (m): 0.52

Hill Gap (m):

Valley Gap (m):

Trim Coils

Number:

Maximum Current (A-turns):

Harmonic Coils

Number: 4x2

Maximum Current (A-turns): 1x120

Main Coils

Number: 2

Total Ampere Turns: 350x336

Maximum Current (A): 350

Stored Energy (MJ):

Total Iron Weight (tons): 120

Total Coil Weight (tons): 10

Power

Main Coils (total KW): 35

Trim Coils (total, maximum, KW):

Refrigerator (cryogenic, KW):

(b)RF

Acceleration

Frequency Range (MHz): 11

Harmonic Modes: 1; 3

Number of Dees: 2

Number of Cavities:

Dee Angular Width (deg.): 180

Voltage

At Injection (peak to ground, KV):

At Extraction (peak to ground, KV): 30

Peak (peak to ground, KV): 60

Line Power (max, KW):

Phase Stability (deg.):

Voltage Stability (%):

(c)Injection

Ion Source: arc

Source Bias Voltage (kV): 0.25

External Injection:

Buncher Type:

Injection Energy (MeV/n):

Component:

Injection Efficiency (%):

Injector:

(d)Extraction

Elements, Characteristic:

Typical Efficiency (%):

Best Efficiency (%):

(e)Vacuum

Pumps: Diffusion

Achieved Vacuum (Pa): 5e-9

REFERENCES Vestnik MSU, ser. fisica, 1979, 4 scattering chambers

dE/dx-E - gamma coincidence

E- t analysis

RBS

COMMENTS