

ENTRY NO: FM01

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Machine Name: Synchrocyclotron 200 MeV protons (SC200)

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History

Designed by: Institut de Physique Nucleaire (I.P.N)/IN2P3/
CNRS

Construction Dates: 09/1975

First Beam Date: 20/06/1977

Characteristic Beams

ions/energy(MeV/N)/current(pps)/power(w)

p 200 4x10E12 128

Transmission Efficiency (source to extracted beam)

Typical (%): 70

Best (%): 75

Emittance

Emittance Definition:

Vertical (pi mm mrad): 9

Horizontal (pi mm mrad): 10

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

USES

Basic Research (%): 0

Development (%): 0

Therapy (%): 75

Isotope Production (%): 0

Other Application (%): 2

Maintenance (%): 13

Beam Tuning (%): 10

Total Time (h/year): 2700

TECHNICAL DATA

(a)Magnet

Type: IRON

Kb (MeV):

Kf (MeV):

Average Field (min./max. T): 1.53-1.61

Number of Sectors:

Hill Angular Width (deg.):

Spiral (deg.):

Pole Diameter (m): 3.2

Injection Radius (m): 0.01

Extraction Radius (m): 1.4

Hill Gap (m):

Valley Gap (m):

Trim Coils

Number: x2

Maximum Current (A-turns):

Harmonic Coils

Number: xNsectorsx2

Maximum Current (A-turns):

Main Coils

Number: 4x2

Total Ampere Turns: 630000

Maximum Current (A): 630

Stored Energy (MJ):

Total Iron Weight (tons): 900

Total Coil Weight (tons): 22

Power

Main Coils (total KW): 360

Trim Coils (total, maximum, KW):

Refrigerator (cryogenic, KW):

(b)RF

Acceleration

Frequency Range (MHz): 24.6 –19.2 Mhz

Harmonic Modes:

Number of Dees:

Number of Cavities:

Dee Angular Width (deg.):

Voltage

At Injection (peak to ground, KV):

At Extraction (peak to ground, KV):

Peak (peak to ground, KV):

Line Power (max, KW):

Phase Stability (deg.):

Voltage Stability (%):

(c)Injection

Ion Source: PIG hot filament

Source Bias Voltage (kV):

External Injection:

Buncher Type:

Injection Energy (MeV/n):

Component:

Injection Efficiency (%):

Injector:

(d)Extraction

Elements, Characteristic: Electromagnetic Channel

Magnetostatic channels(5) efficiency

Typical Efficiency (%): 70

Best Efficiency (%): 75

(e)Vacuum

Pumps: Oil Diffusion Galileo 16000 l/s

Achieved Vacuum (Pa):

REFERENCES

EXPERIMENTAL FACILITIES

COMMENTS

Project to be replaced with a new protontherapy machine.