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PROPERTY

Owned by: Michigan State University 76-86
Construction time: 80-87
Beam: 6/88

CHARACTERISTIC BEAMS

Energy (MeV/n) / current (pps) / power (W) :
- 16O 8+ 200 MeV/n 8.1x10^8 pps 0.4 W
- 20Ne 6+ 100 MeV/n 3.1x10^11 pps 100 W
- 129Xe 30+ 60 MeV/n 6.2x10^8 pps 0.8 W
- 238U 39+ 25 MeV/n 2.5x10^6 pps 2.4 mW

Transmission efficiency (total)
- typical: 1% - best: 5%
Reverse emittance (rms)
- vertical: 8 pi mmmrad
- horizontal: 4 pi mmmrad
Longitudinal emittance (rms) Delta E/E deg RF

Statistics:
Research: 75% therapy: 0%
Development: 3% isotope production: 0%
Research applications: 3% maintenance: 2%
Beam tuning: 17%
Beam time: 5800 h/year

TECHNICAL DATA

Magnet: compact
Energy: 1200 MeV/A Kf: 400 MeV/A
Age field (min-max): 3.0 - 5.3 T
Number of magnet sectors: 3
- angle: deg
- spiral (max): 176 deg
Parameters:
- diameter: 2.197 m
- injection radius: 0.01 m
- extraction radius: 1.03 m
Gap: 0.076 m valley gap: 0.914 m
Trimming:
- trim coils:
 - number: (21x3)+1
 - current (max): 400 A
 - harmonic coils:
 - number: (2x3) (use trim coils)
 - current (max): 400 A
 - others:
 - number:
 - current (max): A
Main coils:
- number: 2
- Ampere-turns: (1544+2329)x2 x(900A)=7x10^6 A.T.
- current: 900 A
Stored energy: 60 MJ
Weight: iron: 240 t coils: 20 t
Power:
- main coils (total): 0 kW
- trim coils (total max): 100 kW
- refrigerator (cryogenic): 850 kW

ACCELERATION

Frequency range: 9-27 MHz
Harmonic modes: 1
Number of dees: 3
Angular aperture: 60 deg
Voltage:
- average (min-max): (60-160) kV
- variation with radius: +13%, -30% at 27 cm, +1.0%, -1.5% at 9 MHz, relative to value at R\_min= 2 cm.
Power in (max): 920 kW
Stability: - phase: 1 deg - voltage: 0.01 %

OTHER CAVITIES

Purpose:
Frequency range: MHz
Region of influence: m
Voltage (max): kV
Power in (max): kW
Stability: - phase: deg - voltage: %

INJECTION

Internal source:
External (radial/axial): Axial
Elements: solenoid lenses, spiral inflector
Source voltage: 8-18 kV
Injection energy: q V\_source/A = (1-9 x 10^-3) MeV/n
Buncher: single grid, h=1
Injection efficiency: 6 (including rf capture) %

ION SOURCES/INJECTOR

RTECR, SCECR

EXTRACTION

Elements, characteristics:
- electrostatic deflectors (2) 6mm gap, 130 kV/cm
- movable passive magnetic dipole + 2 compensators
- movable focusing bars (8) and compensators (6)
- precessional
Efficiency:
- typical: 50% - best: 75%

VACUUM

Pumps: 2 cryopanel, 7K, Cu+ charcoal, 2500 l/s/panel, 3 turbomolecular pumps
Achieved vacuum: 9.3x10^-5 Pa

REFERENCES

MSU Reports MSUCP 29 (June 80) & MSUCP 35 (June 81)
Proc. of 11th Int. Conf. On Cyclotrons (1986) 157

EXPERIMENTAL FACILITIES

Magnetic spectrometer S800, fragment separator A1200, 4 pi array, Miniball, Superball (neutron detector), 92 inch Chamber, Reaction Products Mass Spectrometer, Neutron Wall, Nai Gamma Detector Array

PLAN VIEW OF FACILITY

