

Entry: **C68**
 Machine Name: Texas A&M K500 Cyclotron
 Address: Cyclotron Institute, College Station, TX 77843-3366
 In Charge of the cyclotron: J.B. Natowitz
 Tel: 409/845-1411
 Fax: 409/845-1899

Date: August 28, 1998
 Institution: Texas A&M University
 Web: <http://cyclotron.tamu.edu>
 E-mail: office@comp.tamu.edu

HISTORY

Design by: Michigan State & Texas A&M
 Construction time: 1982 - 1988
 First beam: June 15, 1988

CHARACTERISTIC BEAMS

ions / energy (MeV/p) / current (ppx) / power (W) :
 - $^{20}\text{Ne}^{+7}/35/7$ E 11/83
 - $^{14}\text{Ar}^{+14}/35/1.3$ E 11/28
 - $^{129}\text{Xe}^{+31}/25/3.5$ E 8/0.2
 - $^{209}\text{Bi}^{+35}/10.5/2.6$ E 10/9

transmission efficiency (total)
 - typical: 6 % - best: 12.5 %
 transverse emittance (rms)
 - vertical: π mmrad
 - horizontal: π mmrad
 longitudinal emittance (rms) $\Delta E/E$.deg RF

USES

basic research: 39 % therapy: -- %
 development: 19 % isotope production: -- %
 other applications: 7 % maintenance: 16 %
 beam tuning: 19 %
 total time: 8275 h/year

TECHNICAL DATA

a) magnet Superconducting
 type: 520 MeV/A Kf: 160 MeV/A
 average field (min-max): 3.1 - 4.9 T
 number of magnet sectors: 3
 - angle: 60 deg
 - spiral (max): 113.5 deg
 pole parameters
 - diameter: 1.42 m
 - injection radius: 0.008 m
 - extraction radius: 0.67 m
 hill gap: 0.0635 m valley gap: 0.914 m
 field trimming
 - trim coils
 - number: 13
 - current (max): 400 A
 - harmonic coils
 - number: 2
 - current (max): 400 A
 - others
 - number:
 - current (max): A
 main coils:
 - number: 2
 - Ampere-turns: 4.4 E 6 A.T.
 - current: $\alpha = 800$, $\beta = 600$ A
 stored energy: MJ
 weight : - iron: 100 t - coils: t
 power
 - main coils (total): kW
 - trim coils (total max): 200 kW
 - refrigerator (cryogenic): 0.2 kW

b) RF

- acceleration
 - frequency range: 9 - 28 MHz
 - harmonic modes: 1, 2
 - number of dees: 3
 - angular aperture: 53 deg
 - voltage: - average (min-max): 20 - 90 kV
 - variation with radius:
 - power in (max): 240 kW
 - stability: - phase: 0.1 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: %

c) injection

- internal source: none
 - external (radial/axial): axial
 - elements: spiral inflector
 - source voltage: 3 - 16 kV
 - injection energy: MeV/n
 - buncher: 1st & 2nd harm., single gap
 - injection efficiency: 25 %

d) ion sources/injector

RT ECRIS, 6.4 GHz, High B
 RT ECRIS, 6.4 GHz, Lithium

e) extraction

- elements, characteristics:
 - 2 electrostatic deflectors
 - 5 passive magnetic channels
 - efficiency
 - typical: 50 % - best: 90 %

f) vacuum

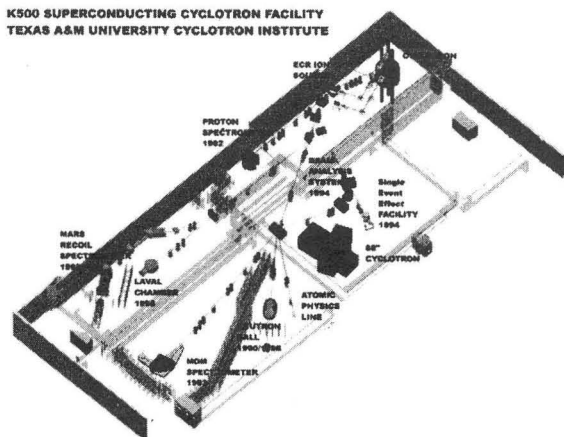
- pumps: 3 turbomolecular +
 3 internal LHe cryopanels
 - achieved vacuum: 10⁻⁵ Pa

REFERENCES

EXPERIMENTAL FACILITIES

Neutron Ball, BaF2 Array, MDM-2 Spectrometer, Momentum Achromat Recoil Spectrometer, Radiation Effects Facility

PLAN VIEW OF FACILITY



COMMENTS

.....
