

ENTRY NO. C69 Date October 1995
 Name of Machine K1200
 Institution Michigan State University
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HISTORY

MILESTONE DATES:

Design 76-86 Model Tests
 Construction 80-87 First Beam 6/88

DESIGN/CONSTRUCTION BY:

in house other
 COST: Accelerator 7,500,000 Facility 35,000,000
 FUNDED BY: DOE(1980-82) NSF(1983-present)

STATUS

STAFF: Machine

Scientists Engineers
 Technicians Students
 Research (in house/external)

Scientists Engineers /
 Technicians Students /

BUDGET: Machine Funded by
 Research Funded by

TIME DISTRIBUTION:

Basic Research (in house/external) % / %
 Applied Program (in house/external) % / %
 Maintenance % Development %

MAGNET

POLE PARAMETERS:

Diameter 219.7 cm R_{extract} 103 cm R_{inject} 1 cm

HILL PARAMETERS: Gap (min) 7.6 cm B_{max} 6.2 T
 (@ 7.2×10^6 AT) Gap (max) 91.4 cm B_{min} 4.5 T

VALLEY PARAMETERS: Gap (min) cm B_{max} T
 (@ AT) Gap (max) cm B_{min} T

AVERAGE FIELD: $\langle B \rangle_{\text{min}}$ 3.0 T $\langle B \rangle_{\text{max}}$ 5.3 T

NUMBER OF SECTORS: compact/separated 3 /
 sector angle deg. spiral (max) 176 deg.

FIELD TRIMMING: Trim Coils (21x3)+1
 Harmonic Coils (2x3)
 Other

CURRENT: Main Coils 900 Amps Stability 1/105
 Trim Coils 400 Amps Stability 6/104
 Stored Energy (cryogenic) 60 MJ

WEIGHT: Iron 265 US ton Conductor 22 US ton

ION ENERGY: Bending Limit E/A = 1200 q^2/A^2 MeV/u
 Focusing Limit E/A = 400 q/A MeV/u

ACCELERATION SYSTEM

FUNDAMENTAL ACCELERATION:

Description: 3 half wavelength cavities 120° phasing
 No. of Gaps/turn 6 $dE/dn(\text{max})$ 0.48 MeV/q
 Voltage (max) 0.160 MV Harmonic $f_{\text{rf}}/f_{\text{ion}}$ 1
 Freq 9-27 MHz Power in(max) 0.92 MW
 Stability: Phase Voltage 1/10

OTHER CAVITIES (Flattopping or otherwise):

Description:
 Region of Influence: R_{min} cm R_{max} cm
 No. of Gaps/turn $dE/dn(\text{max})$ MeV/q
 Voltage (max) MV Harmonic $f_{\text{rf}}/f_{\text{ion}}$
 Freq MHz Power in(max) MW
 Stability: Phase Voltage

VACUUM SYSTEM

OPERATING PRESSURE: 1×10^{-6} Torr

PUMPS: (No. and type) 2 cryopanel, 7K, Cu
 2500.1 l/s/panel 3 turbomolecular pumps

ION SOURCE(S)

Type	Intensity (mA)	@ $\epsilon_n = \beta\gamma\epsilon$ (mm mrad)	Ion Species
(a) RTECR	1.0	0.1-0.2	all
(b)			
(c) SCECR	3.0	0.1-0.3	all
(d)			

INJECTION SYSTEM

Buncher, spiral inflector Efficiency 30 %

EXTRACTION SYSTEM

Precessional, 2 elec. defl. Efficiency 50 %

CHARACTERISTIC BEAMS

Accelerated Ions	E/A (MeV/u)	Internal Current (part μA)	External Current (part μA)
(a) $g+^{16}\text{O}^{8+}$	200	1.3×10^{-3}	0.13×10^{-3}
(b) 20Ne^{10+}	125	3×10^{-3}	0.7×10^{-3}
(c) 129Xe^{54+}	65	3.8×10^{-6}	1.8×10^{-6}
(d) 238U^{94+}	25		0.44×10^{-6}

Secondary Particles	E (MeV)	part/sec
(a) ^7Li	700	2500
(b) ^{20}Mg	1300	3.5
(c) ^{40}Cl	2200	1.6×10^6

EXTRACTED BEAM PROPERTIES:

For 0.5×10^{-3} μA of $^{40}\text{Ar}^{13+}$ ions
 $\Delta E/E$ % $\Delta\phi$ °rf
 $\epsilon_n = \beta\gamma\epsilon$ x 2 π mm mrad z 3 π mm mrad

FACILITIES FOR RESEARCH

SHIELDED AREA: Fixed: m^2 Moveable 1300 m^2
 Target Stations: 6 No. Served At Same Time: 1
 MAGNETIC SPECTROMETERS: S320, S800, A1200
 OTHER FACILITIES: 4 p.l. array, Miniball, Reaction
 Product Mass Spectrometer, 92 inches
 Scattering Chamber, 7T Solenoid, Superball Neutron
 Detector

REFERENCES/NOTES

(a) MSU Reports MSUCP 29 (June 80) & MSUCP 35 (June 81)
 (b) Proc. of 11th Int. Conf. on Cyc. (1986) 157

PLAN VIEW OF FACILITY, COMMENTS

