ENTRY No. 89

NAME OF MACHINE Texas A&M K500 Cyclotron DATE July 1981
INSTITUTION Texas A&M University
ADDRESS College Station, Texas 77843 (USA)
TEL (713) 845-1411 TELEX
IN CHARGE D. H. Youngblood REPORTED BY R. C. Rogers

HISTORY AND STATUS
DESIGN, date 1980 Model tests
ENG DESIGN, date 1981-1984
CONSTRUCTION, date 1982-1985
FIRST BEAM, date (or goal) 1985-86
MAJOR ALTERATIONS
COST, ACCELERATOR
COST, FACILITY, total 10,000,000
FUNDED BY Texas A&M University, Welch Foundation

ACCELERATOR STAFF, OPERATION AND DEVELOPMENT (1)
SCIENTISTS ENGINEERS
TECHNICIANS CRAFTS
GRAD STUDENTS involved during year
OPERATED BY Research staff or Operators
OPERATION hr/wk, On target hr/wk
TIME DISTR. in house %, Outside %
BUDGET, op & dev
FUNDED BY

RESEARCH STAFF, not included above (1)
USERS, in house outside
GRAD STUDENTS involved during year
RESEARCH BUDGET, in house
FUNDED BY

MAGNET
POLE FACE, diameter (compact) 142 cm, R extraction 67 cm
R injection cm
GAP, min 6.35 cm, Field 58 kG
max 91.4 cm, Field 43 kG } at
AVERAGE FIELD at R ext 49 kG } Ampere turns
B max/ <B>
NUMBER OF SECTORS { compact 3 / separated } Spiral, max 113.5 deg
SECTOR ANGLE (SSC) deg
TRIMMING COILS 13
CONDUCTOR, material and type NbTi in Cu
STORED ENERGY (cryogenic) 18 MJ
POWER : main coils 0 max, kW ; current stability
trimming coils 50 max, kW ; current stability
WEIGHT : Fe 100 tons ; coils 8 tons
COOLING system He both
ION ENERGY (bending limit) E/A = 500 q^2/a^2 MeV/amu
(focusing limit) E/A = 160 q /a MeV/amu

ACCELERATION SYSTEM
DEES, number 3 ; angle 53 deg
BEAM APERTURE 2.5 cm ; DC Bias 0 kV
TUNED by, coarse sliding short fine VC
RF 9 to 32 mHz, stable ± 10^{-7}
Orb F 1.3 to 32 mHz
HARMONICS, RF/Orb F, used 1, 2, 3
DEE - Gnd, max 100 kV, min gap 1.0 cm
STABILITY, (pk-pk noise)/(pk RF volt)
ENERGY GAIN, max kV/turn
RF PHASE, stable to ± deg
RF POWER input, max kW
FREQUENCY MODULATION, rate /s
modulator, type
beam pulse, width

VACUUM SYSTEM
OPERATING PRESSURE Torr or mbar
PUMPS, No, Type, Size

ION SOURCES
Internal cold cathode

INJECTION SYSTEM

EXTRACTION SYSTEM
2 Electrostatic deflectors & Magnetic channels

FACILITIES FOR RESEARCH (1)
SHIELDED AREA, fixed 720 m^2 ; movable - m^2
TARGET STATIONS 12 in 5 rooms
STATIONS served at same time, max 1
MAG SPECTROGRAPH, type (1)
COMPUTER model
OTHER FACILITIES

CHARACTERISTIC BEAMS

PARTICLE	ENERGY (MeV) Goal	Achieved	CURRENT (pμA) Internal	External
$^{40}Ar^{13+}$	1200 (2)			
$^{84}Kr^{3++}$	2000 (2)			
$^{197}Au^{41+}$	1200 (2)			
α	320			
SECONDARY			(part/s)	

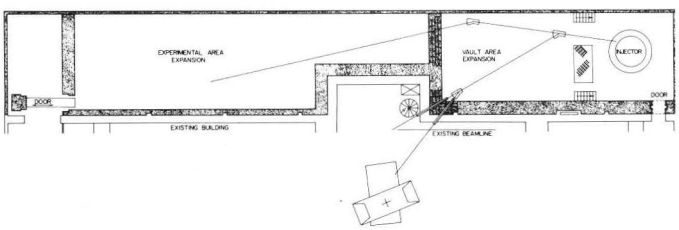
BEAM PROPERTIES

MEASURED	CONDITIONS
PULSE WIDTH RF deg	pμ A of MeV ions
PHASE EXC, max RF deg	pμ A of MeV ions
EXTRACT eff %	pμ A of MeV ions
RESOL ΔE/E %	pμ A of MeV ions
EMITTANCE	
(π mm. mrad) { axial / rad }	pμA of MeV ions

OPERATING PROGRAMS, time distribution
BASIC NUCLEAR PHYSICS SOLID STATES PHYSICS
BIOMEDICAL APPLICAT. ISOTOPE PRODUCTIONS

REFERENCES/NOTES

PLAN VIEW OF FACILITY, NOTEWORTHY FEATURES, COMMENTS



To be used as heavy-ion injector for Texas A&M Variable Energy cyclotron and as stand-alone accelerator.

Notes:
(1) See Texas A&M Variable Energy Cyclotron entry
(2) Specifications for coupled mode operation