

ENTRY NO. 115

NAME OF MACHINE Texas A&M K500 Cyclotron
 INSTITUTION Texas A&M University
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 IN CHARGE D. H. Youngblood REPORTED BY R. C. Rogers

HISTORY AND STATUS

DESIGN, date 1980 Model tests
 ENG DESIGN, date 1981-1986
 CONSTRUCTION, date 1982-1987
 FIRST BEAM, date (or goal) 1987
 MAJOR ALTERATIONS
 COST, ACCELERATOR
 COST, FACILITY, total 8,500,000
 FUNDED BY Texas A&M University, Welch Foundation

ACCELERATOR STAFF, OPERATION AND DEVELOPMENT

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

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} Spiral, max 113.5 deg
 {separated}

SECTOR ANGLE (SSC) deg
 TRIMMING COILS 13

CONDUCTOR, material and type NbTi in Cu
 STORED ENERGY (cryogenic) 22 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 bath
 ION ENERGY (Bending limit) E/A = 500 q²/A² 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 .28 MHz, stable ± 10-7
 Orb F 1.3 to 28 MHz
 HARMONICS, RF/Orb F, used 1, 2, 3, 4, 5, 7
 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, External ECR
 (under construction)

INJECTION SYSTEM

Axial injection (design stage)

EXTRACTION SYSTEM

2 Electrostatic deflectors & Magnetic Channels

FACILITIES FOR RESEARCH

SHIELDED AREA, fixed 720 m²; movable m²
 TARGET STATIONS 12 in 5 rooms
 STATIONS served at same time, max 1
 MAG SPECTROGRAPH, type
 COMPUTER model
 OTHER FACILITIES

CHARACTERISTIC BEAMS

PARTICLE	ENERGY (MeV)		CURRENT (pμA)	
	Goal	Achieved	Internal	External
See projected performance curve below				
SECONDARY				(part/s)

BEAM PROPERTIES

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

OPERATING PROGRAMS, time distribution

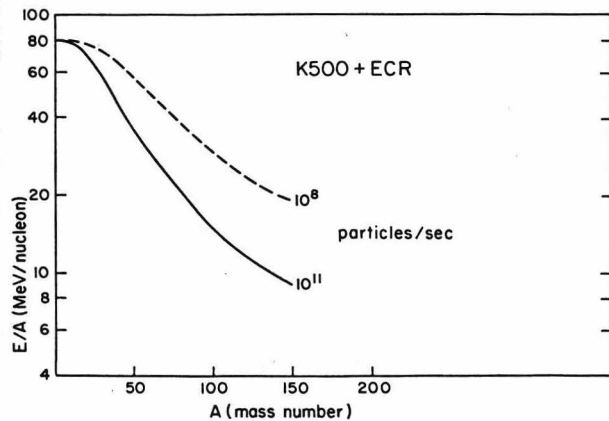
BASIC NUCLEAR PHYSICS SOLID STATES PHYSICS
 BIOMEDICAL APPLICAT ISOTOPE PRODUCTIONS

REFERENCES/NOTES

- 1) See Texas A&M Variable Energy Cyclotron Entry
- 2)

PLAN VIEW OF FACILITY, COMMENTS, ETC.

Projected performance of K500 cyclotron and ECR Ion Source



Facility view shown in Reference 1)