ENTRY No. C59

NAME OF MACHINE Argonne 60 Inch Cyclotron DATE July 10. 1989
INSTITUTION Argonne National Laboratory
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IN CHARGE Robert Atcher REPORTED BY Ed Kemereit / R. Atcher

HISTORY AND STATUS
DESIGN, date 1944-1949 Model tests
ENG DESIGN, date 1949-1951
CONSTRUCTION, date 1950-1952
FIRST BEAM, date (or goal) productive operation July 10, 1952
MAJOR ALTERATIONS Modifications for He^3 - 1964

COST, ACCELERATOR $ 966,456.50
COST, FACILITY, total
FUNDED BY University of Chicago under contract U.S.A.

ACCELERATOR STAFF, OPERATION AND DEVELOPMENT
SCIENTISTS ENGINEERS 1
TECHNICIANS 0 CRAFTS 0
GRAD STUDENTS involved during year 0
OPERATED BY Research staff or 1 Operators
OPERATION 20 hr/wk, On target 20 hr/wk
TIME DISTR. in house %, Outside %
BUDGET, op & dev
FUNDED BY OHER/DOE, Work for others

RESEARCH STAFF, not included above
USERS, in house 3 outside 3
GRAD STUDENTS involved during year 1
RESEARCH BUDGET, in house
FUNDED BY ANL

MAGNET
POLE FACE, diameter (compact) 157.5 cm, R extraction 65.2 cm
R injection 0 cm
GAP, min 25.4 cm, Field 11.2 kG
max 25.4 cm, Field 15.4 kG
AVERAGE FIELD at R ext kG
B max/ <B>
NUMBER OF SECTORS compact 2, separated — Spiral, max deg
SECTOR ANGLE (SSC) deg
TRIMMING COILS 3 pairs - Copper

CONDUCTOR, material and type Main Magnet - Aluminium
STORED ENERGY (cryogenic) MJ
POWER: main coils 65. max, kW ; current stability
trimming coils max, kW ; current stability
WEIGHT : Fe 225 tons ; coils 26 tons
COOLING system water, demineralized
ION ENERGY (bending limit) E/A = q^2/a^2 MeV/amu
(focusing limit) E/A = q^2/a^2 MeV/amu

He^3 at d, α, P ... Ampere turns

ACCELERATION SYSTEM
DEES, number 2 ; angle deg
BEAM APERTURE cm ; DC Bias kV
TUNED by, coarse fine
RF 11.2 to 11.4 mHz, stable ± 100 Hz
Orb F 11.2 to 11.4 mHz
HARMONICS, RF/Orb F, used
DEE - GAP, max 290 kV, min gap cm
STABILITY, (pk-pk noise)/(pk RF volt)
ENERGY GAIN, max kV/turn
RF PHASE, stable to ± deg
RF POWER input, max 100 kW
FREQUENCY MODULATION, rate /s
modulator, type
beam pulse, width

VACUUM SYSTEM
OPERATING PRESSURE 3 to 9 x 10^{-6} Torr or mbar
PUMPS, No, Type, Size 2 - 16 inch Diffusion Pumps ;
2 - Kinney Type Mech. Pumps, 100 CFM + 300 CFM

ION SOURCES
Hooded Graphite Arc Type with 1/8-inch Dia. TA Hair Pin Filament

INJECTION SYSTEM

EXTRACTION SYSTEM 75 KV D.C.

FACILITIES FOR RESEARCH
SHIELDED AREA, fixed 186. m² ; movable m²
TARGET STATIONS 3 in same rooms
STATIONS served at same time, max
MAG SPECTROGRAPH, type none
COMPUTER model
OTHER FACILITIES Senior hot cells; junior hot cells. radiochemistry laboratories including glove box facilities

CHARACTERISTIC BEAMS

PARTICLE	ENERGY (MeV) Goal	Achieved	CURRENT (pμA) Internal	External
Deuterons		21.4		80
Alphas		43.0		30
H_2^+		10.2		50
He^3		33.5		30
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. 50% ISOTOPE PRODUCTIONS 50%

REFERENCES/NOTES

PLAN VIEW OF FACILITY, NOTEWORTHY FEATURES, COMMENTS