

ENTRY No. 89

NAME OF MACHINE Argonne 60 Inch Cyclotron DATE July 10, 1989
INSTITUTION Argonne National Laboratory
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IN CHARGE Jim G. Indler REPORTED BY Ed Kemereit

HISTORY AND STATUS

DESIGN, date 1944-1949 Model tests
ENG DESIGN, date 1949-1951
CONSTRUCTION, date 1950-1952
FIRST BEAM date for peak productive operation July 10, 1952
MAJOR ALTERATIONS Modifications for He³ - 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 10 hr/wk, On target 10 hr/wk
TIME DISTR. in house % Outside %
BUDGET, op & dev
FUNDED BY ANL-CHEM. Division

RESEARCH STAFF, not included above

USERS, in house 2 outside
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 } He³
max 25.4 cm, Field 15.4 kG } at d., α, P
AVERAGE FIELD at R ext kG } Ampere turns
B max/ < B >

NUMBER OF SECTORS { compact 2 } Spiral, max .. deg
separated
SECTOR ANGLE (SSC) deg
TRIMMING COILS 3 pairs - Copper

CONDUCTOR, material and type Main Magnet - Aluminum

STORED ENERGY (cryogenic) MJ
POWER: main coils 65 max, kW; current stability
trimming coils max, kW; current stability

WEIGHT: Fe 225 tons; coils 20 tons

COOLING system water, demineralized

ION ENERGY (bending limit) E/A = q²/a² MeV/amu
(focusing limit) E/A = q²/a² MeV/amu

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 Hz²

Orb F 11.2 to 11.4 MHz

HARMONICS, RF/Orb F, used

DEE - Old, 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
TARGET STATIONS 3 in same room

STATIONS served at same time, max

MAG SPECTROGRAPH, type none

COMPUTER model

OTHER FACILITIES

CHARACTERISTIC BEAMS

PARTICLE	ENERGY (MeV)		CURRENT (pA)	
	Goal	Achieved	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 pA of MeV ions

PHASE EXC, max RF deg pA of MeV ions

EXTRACT eff % pA of MeV ions

RESOL ΔE/E % pA of MeV ions

EMITTANCE

(π mm. mrad) { axial } pA of MeV ions

{ rad }

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