

ENTRY NO. 10

NAME OF MACHINE CICLOTRON DE LA UNIVERSIDAD DE CHILE

INSTITUTION FACULTAD DE CIENCIAS, UNIVERSIDAD DE CHILE

ADDRESS casilla 653, SANTIAGO, CHILE

TEL 2254375 TELEX 240230 CL NUCLEAR

IN CHARGE J.B. Morales REPORTED BY J.R. Morales

HISTORY AND STATUS

DESIGN, date 1960 Model tests 1962
ENG DESIGN, date 1960-1964
CONSTRUCTION, date 1962, see note (1)
FIRST BEAM, date (or goal) 1962 (Davis) 1967 (Stgo.) see note (2)
MAJOR ALTERATIONS New design MS and RI

COST, ACCELERATOR \$ 500,000
COST, FACILITY, total \$ 300,000
FUNDED BY U. de Chile, U. Chile + U. California

ACCELERATOR STAFF, OPERATION AND DEVELOPMENT

SCIENTISTS 1 ENGINEERS 1
TECHNICIANS 1 CRAFTS

GRAD STUDENTS involved during year
OPERATED BY 1 Research staff or 1 Operators
OPERATION 25 hr/wk On target 20 hr/wk
TIME DISTR. in house 100% Outside %

BUDGET, op & dev \$ 40,000
FUNDED BY U. of Chile

RESEARCH STAFF, not included above

USERS, in house 2 outside 1
GRAD STUDENTS involved during year 3

RESEARCH BUDGET, in house \$ 10,000
FUNDED BY U. of Chile and I.A.E.A.

MAGNET

POLE FACE, diameter (compact) 60 cm, R extraction 25 cm
R injection cm

GAP, min cm, Field kG
max 4.4 cm, Field 19.7 kG at 0.2-10^6
AVERAGE FIELD at R ext 19.7 kG Ampere turns
B max / < B >

NUMBER OF SECTORS { compact 3 } Spiral, max 45 deg
{ separated }

SECTOR ANGLE (SSC) deg

TRIMMING COILS 1/sect.

CONDUCTOR, material and type Cu pipes

STORED ENERGY (cryogenic) J

POWER: main coils 74 max, kW; current stability 10^-4
trimming coils max, kW; current stability

WEIGHT: Fe tons; coils tons

COOLING system water

ION ENERGY (bending limit) E/A = q^2/a^2 MEV/amu
(focusing limit) E/A = q/a MEV/amu

ACCELERATION SYSTEM

DEES, number 2 110 deg

BEAM APERTURE 1.5 cm; DC Bias kV

TUNED by, coarse MS fine MC

RF 15 to 30 MHz, stable +/- 10^-6

Orb F to MHz

HARMONICS, RF/Orb F, used

DEE-Gnd, max 60 kV, min gap cm

STABILITY, (pk-pk noise)/(pk RF volt) 0.05

ENERGY GAIN, max 100 kV/turn

RF PHASE, stable to +/- deg

RF POWER input, max 15 kW

FREQUENCY MODULATION, rate /s

modulator, type

beam pulse, width

VACUUM SYSTEM

OPERATING PRESSURE 40 u Torr or mbar

PUMPS, No, Type, Size LEYBOLD E-250/

Two diffusion pumps

ION SOURCES

A "Cold-Cathode" ion source is now being used.

INJECTION SYSTEM

EXTRACTION SYSTEM

Electrostatic

FACILITIES FOR RESEARCH

SHIELDED AREA, fixed m^2; movable m^2

TARGET STATIONS 3 in 2

STATIONS served at same time, max 1

MAG SPECTROGRAPH, type

COMPUTER model Digital LSI/H (HEATHKIT H 19)

OTHER FACILITIES 19 in. ORTEC Scatt. Chamber

CHARACTERISTIC BEAMS

Table with columns: PARTICLE, ENERGY (MeV) Goal, Achieved, CURRENT (pA) Internal, External. Rows for p, d, He.

SECONDARY n 20 (part/s) 10^5

BEAM PROPERTIES

Table with columns: MEASURED, CONDITIONS. Rows for PULSE WIDTH, PHASE EXC, EXTRACT eff, RESOL dE/E, EMITTANCE.

OPERATING PROGRAMS, time distribution

BASIC NUCLEAR PHYSICS 20% SOLID STATES PHYSICS

BIOMEDICAL APPLICAT. ISOTOPE PRODUCTIONS

Machine research 15% PIXE 50%

Activation Analysis 15%

REFERENCES/NOTES

- 1) Nucl. Inst. Meth. 18,19, 120-124 and 125-128 (1962)
2) UCD - CNL 56 Report (1970)
U. Chile - U. Calif. cooperative program, financed by Ford Foundation.

PLAN VIEW OF FACILITY, COMMENTS, ETC.

- 1.- The beam is pulsed with a variable duty cycle up to 50% through the RF system
2.- Facilities include a spherical neutron pit with a radius of approx. 5 m and with a centred target holder.

