

ENTRY NO. **C6** Date December 1995
 Name of Machine CYCLOTRON
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HISTORY
MILESTONE DATES:
 Design 1960 Model Tests 1962
 Construction 1960-1964 First Beam 1962 (Davis)
DESIGN/CONSTRUCTION BY: 1967 (Santiago)
 in house U. Calif. other
COST: Accelerator 500,000 Facility 300,000
FUNDED BY: University of Chile

STATUS
STAFF: Machine
 Scientists 1 Engineers 1
 Technicians 1 Students
Research (in house/external)
 Scientists 4 / 2 Engineers /
 Technicians 1 / 1 Students 1 / 3
BUDGET: Machine 10,000 Funded by U. of Chile
 (1993-95) Research 50,000 Funded by IAEA
TIME DISTRIBUTION:
 Basic Research (in house/external) 15 % / %
 Applied Program (in house/external) 50 % / %
 Maintenance 25 % Development 10 %

MAGNET
POLE PARAMETERS:
 Diameter cm $R_{extract}$ cm R_{inject} cm
HILL PARAMETERS: Gap (min) cm B_{max} T
 (@ AT) Gap (max) cm B_{min} T
VALLEY PARAMETERS: Gap (min) cm B_{max} T
 (@ AT) Gap (max) cm B_{min} T
AVERAGE FIELD: $\langle B \rangle_{min}$ 0.62 T $\langle B \rangle_{max}$ 1.97 T
NUMBER OF SECTORS: compact/separated 3 /
 sector angle deg. spiral (max) deg.
FIELD TRIMMING: Trim Coils 1 / sector
 Harmonic Coils
 Other
CURRENT: Main Coils Amps Stability
 Trim Coils Amps Stability
 Stored Energy (cryogenic) MJ
WEIGHT: Iron 50 Tons Conductor 3 Tons
ION ENERGY: Bending Limit E/A = q^2/A^2 MeV/u
 Focusing Limit E/A = q/A MeV/u

ACCELERATION SYSTEM
FUNDAMENTAL ACCELERATION:
 Description: 2 DEES 100° Angle
 No. of Gaps/turn $dE/dn(max)$ MeV/q
 Voltage (max) MV Harmonic f_r/f_{ion}
 Freq. 15-30 MHz Power in(max) MW
 Stability: Phase Voltage
OTHER CAVITIES (Flattopping or otherwise):
 Description:
 Region of Influence: R_{min} cm R_{max} cm
 No. of Gaps/turn $dE/dn(max)$ MeV/q
 Voltage (max) MV Harmonic f_r/f_{ion}
 Freq. MHz Power in(max) MW
 Stability: Phase Voltage

VACUUM SYSTEM
OPERATING PRESSURE: 45 u
PUMPS: (No. and type) LEYBOLD E-250 / TWO DIFFUSION
 PUMPS

ION SOURCE(S)
 Type Intensity @ $\epsilon_n = \beta\gamma\epsilon$ Ion Species
 (mA) (π mm mrad) $H^+ D^+ ^4He^{++}$
 (a) Cold Cathode
 (b)
 (c)
 (d)

INJECTION SYSTEM
 Efficiency %

EXTRACTION SYSTEM
 Efficiency %

CHARACTERISTIC BEAMS
 Accelerated Ions E/A (MeV/u) Current (part μA)
 Internal External
 (a) H^+ 10 15 1.0
 (b) D^+ 4.8 10 2.0
 (c) $^4He^{++}$ 10 0.5 0.3
 (d)

Secondary Particles E (MeV) part/sec 10^3
 (a) Neutrons 20
 (b)
 (c)

EXTRACTED BEAM PROPERTIES:
 For μA of MeV/u ions
 $\Delta E/E$ % $\Delta\phi$ °
 $\epsilon_n = \beta\gamma\epsilon$ π mm mrad z π mm mrad

FACILITIES FOR RESEARCH
 SHIELDED AREA: Fixed: 150 m² Moveable m²
 Target Stations: 3 No. Served At Same Time: 1
MAGNETIC SPECTROMETERS:
OTHER FACILITIES:
 19 INCH ORTEC SCATTERING CHAMBER AUTOMATED
 MULTITARGET PIXE CHAMBER PROVIDED BY IAEA (1995)

REFERENCES/NOTES
 (a) NUCL. INST. METH. 18, 19, 12, 124 and 125-128 (1962)
 (b) UCD - CNL 56 Report (1970)
 (c) CYCLOTRON TRANSFERRED: UC Davis to U. Chile through U. Chile - U. Calif. coop. program funded by Ford Foundation 1967

