

ENTRY NO. 97

NAME OF MACHINE Davis 76" Cyclotron
INSTITUTION Crocker Nuclear Laboratory, University of California, Davis
ADDRESS Davis, California USA
TEL (916) 752-1460
IN CHARGE Tom Cahill REPORTED BY Carlos Castaneda/Tom Cahill

HISTORY AND STATUS

DESIGN, date Model tests
ENG DESIGN, date ORIC copy
CONSTRUCTION, date 1964-1966
FIRST BEAM, date (or goal) 1966
MAJOR ALTERATIONS none

COST, ACCELERATOR 1.4 x 10^6
COST, FACILITY, total 4.5 x 10^6
FUNDED BY recharges for beams and services

ACCELERATOR STAFF, OPERATION AND DEVELOPMENT

SCIENTISTS 1.5 ENGINEERS 1
TECHNICIANS 6.0 CRAFTS 2.0
GRAD STUDENTS involved during year 5
OPERATED BY Research staff or 4 Operators
OPERATION 140 hr/wk. On target 50 hr/wk
TIME DISTR. in house 95 % Outside 5 %
BUDGET, op & dev 450 K\$
FUNDED BY recharges for beams and shops

RESEARCH STAFF, not included above

USERS, in house 12 outside 24
GRAD STUDENTS involved during year 40
RESEARCH BUDGET, in house 1.0 M\$
FUNDED BY Radiopharm. Co., NPS, EPA, DOE, NSF

MAGNET

POLE FACE, diameter (compact) 193 cm, R extraction 80 cm
R injection cm
GAP, min 19 cm, Field 22.7 kG
min 71 cm, Field 12.7 kG at 0.8 x 10^6
AVERAGE FIELD at R ext 17.5 kG Ampere turns
B max / < B > 13
NUMBER OF SECTORS { compact 3 } Spiral, max 30 deg
{ separated }
SECTOR ANGLE (SSC) deg
TRIMMING COILS 10

CONDUCTOR, material and type hollow copper
STORED ENERGY (cryogenic) MJ
POWER: main coils 800 max, kW; current stability +10^-5
trimming coils 800 max, kW; current stability +10^-5
WEIGHT: Fe 2.68 tons; coils 42 tons
COOLING system deionized water
ION ENERGY (bending limit) E/A = 90 q^2/a^2 MEV/amu
(focusing limit) E/A = q/a MEV/amu

ACCELERATION SYSTEM

DEES, number 1 180 deg
BEAM APERTURE 4.5 cm; DC Bias 0 kV
TUNED by, coarse MS fine VC auto
RF 7.3 to 22 MHz, stable +/- 1/10^6
Orb F 1.5 to 22 MHz
HARMONICS, RF/Orb F, used 1.3
DEE-Gnd, max 120 kV, min gap 1 cm
STABILITY, (pk-pk noise)/(pk RF volt) 0.005
ENERGY GAIN, max 240 kV/turn
RF PHASE, stable to +/- 1.0 deg
RF POWER input, max 150 kW
FREQUENCY MODULATION, rate
modulator, type
beam pulse, width

VACUUM SYSTEM

OPERATING PRESSURE 4 x 10^-7 Torr or mbar
PUMPS, No, Type, Size 2 diffusion, 2m

ION SOURCES

hot filament, modified LBL 88" source

INJECTION SYSTEM

none

EXTRACTION SYSTEM

Electrostatic + 2 magnetic

FACILITIES FOR RESEARCH

SHIELDED AREA, fixed 360 m^2; movable m^2
TARGET STATIONS 10 in 4 rooms
STATIONS served at same time, max 1
MAG SPECTROGRAPH, type none
COMPUTER model PDP 15/40; 2 PDP 11/44; PDP 11/23
OTHER FACILITIES XRF, PIXE Systems; Co-60 Irradiation
source; hot radiochemical labs; isotope production; large
area irradiation station; 0-(n,p) facility; off-line counting
station (ND65 & ND66 multichannel analyzer)

CHARACTERISTIC BEAMS

Table with columns: PARTICLE, ENERGY (MeV), CURRENT (pA). Rows include p, d, alpha, 3He, SECONDARY n.

BEAM PROPERTIES

MEASURED CONDITIONS
PULSE WIDTH 10^-9 RF deg 20 pA of .65 MeV p ions
PHASE EXC max RF deg pA of MeV ions
EXTRACT eff % pA of MeV ions
RESOL DELTA E/E % pA of MeV ions
EMITTANCE { axial } pA of MeV
{ rad }

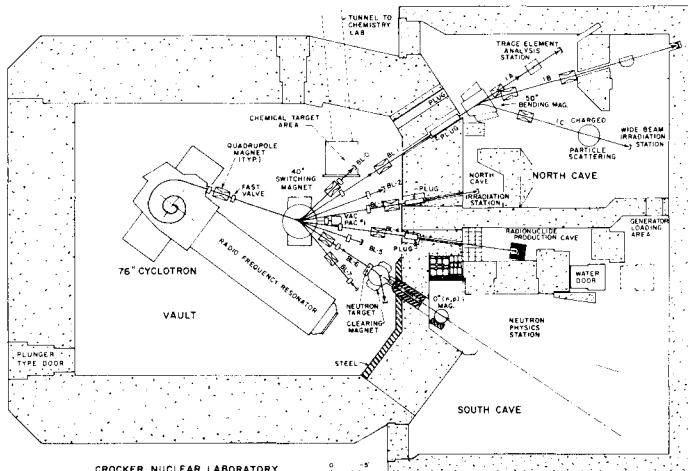
OPERATING PROGRAMS, time distribution

BASIC NUCLEAR PHYSICS 10% SOLID STATES PHYSICS 5%
BIOMEDICAL APPLICAT 15% ISOTOPE PRODUCTIONS 40%
Atomic 5%, Analytical Services (PIXE) 20%
Biological (N-13) 5%

REFERENCES/NOTES

- 1) Accelerator supported on beam and services
2) recharged since 1971.

PLAN VIEW OF FACILITY, COMMENTS, ETC.



CROCKER NUCLEAR LABORATORY