

ENTRY No. 16

NAME OF MACHINE Isochronous Cyclotron U-120 M DATE
INSTITUTION Institute of Nuclear Physics
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TEL TELEX
IN CHARGE V. Bejsovec REPORTED BY V. Bejsovec

HISTORY AND STATUS

DESIGN, date 1969-1971 Model tests 1971-1975
ENG DESIGN, date
CONSTRUCTION, date 1972-1975
FIRST BEAM, date (or goal) 1976
MAJOR ALTERATIONS

COST, ACCELERATOR

COST, FACILITY, total
FUNDED BY Czechoslovak Academy of Sciences

ACCELERATOR STAFF, OPERATION AND DEVELOPMENT

SCIENTISTS 3 ENGINEERS 3
TECHNICIANS 4 CRAFTS

GRAD STUDENTS involved during year

OPERATED BY Research staff or Operators

OPERATION 120 hr/wk, On target 100 hr/wk

TIME DISTR. in house %, Outside %

BUDGET, op & dev

FUNDED BY

RESEARCH STAFF, not included above

USERS, in house outside

GRAD STUDENTS involved during year

RESEARCH BUDGET, in house

FUNDED BY

MAGNET

POLE FACE, diameter (compact) 120 cm, R extraction 51 cm

R injection 0 cm

GAP, min 8.2 cm, Field 20 kG } at 0.4x10^6

max 22 cm, Field 16 kG } Ampere turns

AVERAGE FIELD at R ext 18 kG

B max/ <B> 1.12

NUMBER OF SECTORS { compact 4 } Spiral, max 70 deg

SECTOR ANGLE (SSC) 0 deg

TRIMMING COILS

CONDUCTOR, material and type Cu, 18x18/ 10

STORED ENERGY (cryogenic) 10 MJ

POWER: main coils 180 max, kW; current stability 2/10^5

trimming coils 160 max, kW; current stability 5/10^4

WEIGHT: Fe 117 tons; coils 15 tons

COOLING system Demineralized Water

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

(focusing limit) E/A = q^2/a^2 MeV/amu

ACCELERATION SYSTEM

DEES, number 1; angle 180 deg

BEAM APERTURE 1.8 cm; DC Bias 0 kV

TUNED by, coarse MP, fine YC, auto

RF 10 to 26 MHz, stable +/- 1/10^7

Orb F 10 to 26 MHz

HARMONICS, RF/Orb F, used 1

DEE - Gnd, max 50 kV, min gap 3 cm

STABILITY, (pk-pk noise)/(pk RF volt) 1/10^3

ENERGY GAIN, max 100 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 1.10^-5 Torr or mbar

PUMPS, No, Type, Size 2 oil diffusion pumps

ION SOURCES

Hot filament ion source

INJECTION SYSTEM

EXTRACTION SYSTEM

Electrostatic

FACILITIES FOR RESEARCH

SHIELDED AREA, fixed 265 m^2; movable m^2

TARGET STATIONS 7 in 3 rooms

STATIONS served at same time, max

MAG SPECTROGRAPH, type multi-angle

COMPUTER model M. 6000 + ADT. 4500

OTHER FACILITIES

CHARACTERISTIC BEAMS

Table with columns: PARTICLE, ENERGY (MeV) Goal, Achieved, CURRENT (pA) Internal, External. Rows include p, d, 4He2+, 3He2+.

SECONDARY (part/s)

BEAM PROPERTIES

MEASURED CONDITIONS

PULSE WIDTH 30 RF deg pA of MeV ions

PHASE EXC, max RF deg pA of MeV ions

EXTRACT eff 60 % 10 pA of 33 MeV p. ions

RESOL delta E/E 0.5 % pA of MeV ions

EMITTANCE

(pi mm. mrad) { 10 axial } pA of MeV ions

{ 20 rad }

OPERATING PROGRAMS, time distribution

BASIC NUCLEAR PHYSICS 50% SOLID STATES PHYSICS 10%

BIOMEDICAL APPLICAT. 10% ISOTOPE PRODUCTIONS 30%

REFERENCES/NOTES

PLAN VIEW OF FACILITY, NOTEWORTHY FEATURES, COMMENTS