

ENTRY No. 105

NAME OF MACHINE Kiev Isochronous Cyclot DATE July, 1981
 INSTITUTION Institute Nuclear Research, Academy of Science UkSSR
 ADDRESS USSR Kiev 252028, Prospect Nauky, 119
 TEL 632349 TELEX 132400 Proton
 IN CHARGE O.F.Nemets REPORTED BY A.F.Linev

HISTORY AND STATUS

DESIGN, date 1965-1970 Model tests 1963-1966
 ENG DESIGN, date 1966-1972
 CONSTRUCTION, date 1966-1973
 FIRST BEAM, date (or goal) March 1976
 MAJOR ALTERATIONS

COST, ACCELERATOR

COST, FACILITY, total

FUNDED BY

ACCELERATOR STAFF, OPERATION AND DEVELOPMENT

SCIENTISTS ENGINEERS
 TECHNICIANS CRAFTS
 GRAD STUDENTS involved during year
 OPERATED BY Research staff or 100 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) 240 cm, R extraction 103 cm
 R injection cm
 GAP, min 232 cm, Field 23.0 kG }
 max 532 cm, Field 11.2 kG } at 0.83x10⁶
 AVERAGE FIELD at R ext 17.0 kG } Ampere turns
 B max/ 1.35

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

SECTOR ANGLE (SSC) deg

TRIMMING COILS 15 Circ coils

Harmonic coils 3 per sector

CONDUCTOR, material and type Cupruous

STORED ENERGY (cryogenic) MJ5

POWER: main coils 200 max, kW ; current stability 5x10⁻⁴

trimming coils 800 max, kW ; current stability 10⁻⁴

WEIGHT: Fe 650 tons ; coils 83.2 tons

COOLING system Demineralized water

ION ENERGY (bending limit) E/A = 140 q²/a² MeV/amu

(focusing limit) E/A = 100 q/a MeV/amu

ACCELERATION SYSTEM

DEES, number 1 ; angle 180 deg

BEAM APERTURE 5 cm; DC Bias 0 kV

TUNED by coarse Movable Sh fine VC auto

RF 7.5 to 22.5 MHz, stable \pm 0.01/10⁶

Orb F 2.5 to 22.5 MHz

HARMONICS, RF/Orb F, used 1,3

DEE - Gnd, max 125 kV, min gap 5 cm

STABILITY, (pk-pk noise)/(pk RF volt) 1/1000

ENERGY GAIN, max 250 kV/turn

RF PHASE, stable to \pm deg

RF POWER input, max 450 kW

FREQUENCY MODULATION, rate /s

modulator, type

beam pulse, width

VACUUM SYSTEM

OPERATING PRESSURE 5/10⁶ Torr or mbar

PUMPS, No, Type, Size 3 Diffusion pumps

(50 cm)

ION SOURCES

Heated Cathode

INJECTION SYSTEM

axial injection (1982)

EXTRACTION SYSTEM dc electrostatic with compensated magnetic channel and iron channel

FACILITIES FOR RESEARCH

SHIELDED AREA, fixed 1000 m²; movable 1200 m²
 TARGET STATIONS 15 in 6 rooms
 STATIONS served at same time, max 1
 MAG SPECTROGRAPH, type UBK-2, M-6000, M-400, EC-10-10
 COMPUTER model
 OTHER FACILITIES

CHARACTERISTIC BEAMS

PARTICLE	ENERGY (MeV)		CURRENT (pμA)	
	Goal	Achieved	Internal	External
p	100	72	100	15
d	70	64		
d	140	128		

SECONDARY

(part/s)

BEAM PROPERTIES

MEASURED CONDITIONS
 PULSE WIDTH 15 RF deg 5 pμA of 50 MeV p ions
 PHASE EXC, max 15 RF deg pμA of MeV ions
 EXTRACT eff 60 % pμA of MeV ions
 RESOL ΔE/E 0.3 % pμA of MeV ions
 EMITTANCE
 (π mm. mrad) { 30 axial } pμA of 50 MeV p ions
 { 40 rad }

OPERATING PROGRAMS, time distribution

BASIC NUCLEAR PHYSICS 50% SOLID STATES PHYSICS 30%

BIOMEDICAL APPLICAT. 10% ISOTOPE PRODUCTIONS 10%

REFERENCES/NOTES

1. Atomnaja Energia, 6, 1976.
2. VIII International Conference on Cyclotr. Bloomington, September, 18-21, 1978

PLAN VIEW OF FACILITY, NOTEWORTHY FEATURES, COMMENTS

1. The valley coil will operate at Ep-80 Mev
2. The cyclotron is intended to be as a pulsed neutron generator.
3. The source of polarized protons and deuterons will be designed and installed (1982)