

ENTRY NO. 111

NAME OF MACHINE Kiev Isochronous Cyclot. DATE July, 1981
INSTITUTION Institute Nuclear Research, Academy of Science USSR
ADDRESS USSY 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 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
min 532 cm, Field 11.2 kG at 0.83×10^6
AVERAGE FIELD at R ext 17.0 kG Ampere turns
B max / < B > 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 Cuprous
STORED ENERGY (cryogenic) MJ
POWER: main coils 200 max, kW; current stability $5 \cdot 10^{-5}$
trimming coils 800 max, kW; current stability 10^{-4}
WEIGHT: Fe 650 tons; coils 83.5 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 Moveable Sh fine VC auto
RF 7.5 to 22.5 MHz, stable $\pm 0.01/10^6$
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 $5/10^6$ 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 (μ A)	
	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 μ A of	50 MeV p ions
PHASE EXC	max 15 RF deg	μ A of	MeV ions
EXTRACT eff	60 %	μ A of	MeV ions
RESOL $\Delta E/E$	0.3 %	μ A of	MeV ions
EMITTANCE	{ 30 axial } { 40 rad }	5 μ A of	50 MeV p ions

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 Cyclotrons, Bloomington, September, 18-21, 1978.

PLAN VIEW OF FACILITY, COMMENTS, ETC.

1. The valley coil will operate at $E_p: 80$ MeV
2. The cyclotron is intended to be as a pulse neutron generator.
3. The source of polarized protons and deuterons will be designed and installed (1982).