ENTRY NO. 131

NAME OF MACHINE Cyclotron IAE

INSTITUTION Kurchatov Institute of Atomic Energy

ADDRESS 123182 Moscow, USSR

TEL ..... TELEX .....

IN CHARGE ..... REPORTED BY N.I.Venikov

HISTORY AND STATUS

DESIGN, date 1971-73 ..... Model tests 1973-74 .....

ENG DESIGN, date 1974-75 .....

CONSTRUCTION, date 1976 .....

FIRST BEAM, date (or goal) 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 ..... hr/wk. On target ..... 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) 150 cm, R-extraction 67.5 cm

R injection ..... cm

GAP, min 20 cm, Field 21 kG
max 34 cm, Field 15 kG } at 8.3×10^5 Ampere turns

AVERAGE FIELD at R ext 18 kG

B max/<B> 1.18 .....

NUMBER OF SECTORS { compact 3 / separated ..... } Spiral, max 50 deg

SECTOR ANGLE (SSC) ..... deg

TRIMMING COILS Harmonic, 3 pairs; concentric, 8 pairs .....

CONDUCTOR, material and type copper .....

STORED ENERGY (cryogenic) ..... MJ

POWER: main coils 180 max kW: current stability 2×10^{-5}

trimming coils 70 max kW: current stability 10^{-4}

WEIGHT: Fe 300 tons: coils 70 tons

COOLING system Air, water .....

ION ENERGY (Bending limit) E/A = 62 q^2/A^2 MeV/amu

(Focusing limit) E/A = 35 q/A MeV/amu

ACCELERATION SYSTEM

DEES, number 2 angle 180 deg

BEAM APERTURE 4 cm; DC Bias 0 kV

TUNED by, coarse MS fine VC, auto

RF 6 to 20 MHz, stable ± 10^{-3} %

Orb F 2 to 20 MHz

HARMONICS, RF/Orb F, used 3

DEE–Gnd, max ..... kV, min gap ..... cm

STABILITY, (pk-pk noise)/(pk RF volt) 0.2%

ENERGY GAIN, max 300 kV/turn

RF PHASE, stable to ± ..... deg

RF POWER input, max. 150 kW

FREQUENCY MODULATION, rate ..... /s

modulator, type .....

beam pulse, width .....

VACUUM SYSTEM

OPERATING PRESSURE 10^{-5} Torr or mbar

PUMPS, No, Type, Size .....

.....

.....

ION SOURCES

Penning type .....

INJECTION SYSTEM

.....

EXTRACTION SYSTEM

Electrostatic defl., magnetic channel .....

FACILITIES FOR RESEARCH

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

TARGET STATIONS 7 in 4 rooms

STATIONS served at same time, max .....

MAG SPECTROGRAPH, type MASE .....

COMPUTER model .....

OTHER FACILITIES .....

.....

.....

CHARACTERISTIC BEAMS

PARTICLE	ENERGY (MeV) Goal	Achieved	CURRENT (pμA) Internal	External
^{6}Li, d	5 – 30	5 – 31	.....	30
^{12}C	15 – 90	15 – 93	.....	7.5 – 1.5
^{14}N	72	80	.....	7.5
SECONDARY	100	110	.....	3
			(part/s)	
.....	.....	.....	.....	.....
.....	.....	.....	.....	.....

BEAM PROPERTIES

MEASURED		CONDITIONS		
PULSE WIDTH	7 RF deg	2 pμA of	20 MeV	p ions
PHASE EXC. max	..... RF deg	..... pμA of	..... MeV	..... ions
EXTRACT eff	60 %	30 pμA of	30 MeV	p ions
RESOL ΔE/E	0.5 %	2 pμA of	..... MeV	..... ions
EMITTANCE				
(π mm-mrad)	30 axial 20 rad	0.3 pμA of	93 MeV	^{6}Li ions

OPERATING PROGRAMS, time distribution

BASIC NUCLEAR PHYSICS .... SOLID STATES PHYSICS .....

BIOMEDICAL APPLICAT..... ISOTOPE PRODUCTIONS .....

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REFERENCES/NOTES

1) Venikov N. e.a. IEEE Trans. on Nucl. Sci., v. NS-26 (1979) 1996.

PLAN VIEW OF FACILITY, COMMENTS, ETC.