

ENTRY No. FM-10

NAME OF MACHINE **DUBNA 700 MeV HIGH INTENSITY PHASOTRON** Date : August 1978
 INSTITUTION Joint Institute for Nuclear Research, Lab. of Nucl. Pr.
 ADDRESS JINR, Head Post Office, P.O. Box 79, MOSCOW, USSR
 TEL TELEX
 IN CHARGE Pr. V.P. DZHELEPOV REPORTED BY Pr. V.P. DZHELEPOV

HISTORY AND STATUS

DESIGN, date 1967 Model tests 1968-1974
 ENG DESIGN, date 1968-1974
 CONSTRUCTION, date 1971-1978
 FIRST BEAM, date (or goal) 1980
 MAJOR ALTERATIONS

COST, ACCELERATOR

COST, FACILITY, total .. 18 x 10⁶ roubles
 FUNDED BY J.I.N.R.

ACCELERATOR STAFF, OPERATION AND DEVELOPMENT

SCIENTISTS ENGINEERS
 TECHNICIANS CRAFTS
 GRAD STUDENTS involved during year
 OPERATED BY Research staff or Operators
 OPERATION 156 hr/wk, On target hr/wk
 TIME DISTR. in house 80 %, Outside 20 %
 BUDGET, op & dev
 FUNDED BY

RESEARCH STAFF, not included above

USERS, in house 200 outside 80
 GRAD STUDENTS involved during year
 RESEARCH BUDGET, in house
 FUNDED BY

MAGNET

POLE FACE, diameter (compact) 600 cm, R extraction 270 cm
 R injection cm
 GAP, min 15-30 cm, Field 18 kG }
 max 120 cm, Field 12 kG } at 1.7 · 10⁶
 AVERAGE FIELD at R ext 16.3 kG } Ampere turns
 B max/ 1.1

NUMBER OF SECTORS { compact 4 } Spiral, max .77deg
 { separated }

SECTOR ANGLE (SSC) deg
 TRIMMING COILS Harmonic correction : 3/Sector

CONDUCTOR, material and type
 STORED ENERGY ~10 MJ

POWER : main coils 1100 max, kW ; current stability 5 · 10⁻⁵
 trimming coils max, kW ; current stability

WEIGHT : Fe 7000 tons ; coils 165 tons
 COOLING system Demineralized water

ION ENERGY (bending limit) E/A = q²/a² MeV/amu
 (focusing limit) E/A = q/a MeV/amu

ACCELERATION SYSTEM

DEES, number 1 ; angle 180 deg
 BEAM APERTURE 7-10 cm ; DC Bias 2 kV
 TUNED by, coarse VC fine
 RF 18.4 to 14.4 MHz, stable ±
 Orb F 18 to 14 MHz
 HARMONICS, RF/Orb F, used 1
 DEE - Gnd, max 50 kV, min gap cm
 STABILITY, (pk-pk noise)/(pk RF volt)
 ENERGY GAIN, max 80 kV/turn
 RF PHASE, stable to ± 200 deg
 RF POWER input, max kW
 FREQUENCY MODULATION, rate 600 /s
 modulator, type
 beam pulse, width

VACUUM SYSTEM

OPERATING PRESSURE 8-10 · μ Torr
 PUMPS, No, Type, Size 3 diffusion pumps

ION SOURCES

RIG. type

INJECTION SYSTEM

Axial injector & polarized ion source

EXTRACTION SYSTEM

Iron-current channel, 70 %

FACILITIES FOR RESEARCH

SHIELDED AREA, fixed 1500 m² ; movable m²
 TARGET STATIONS 4-7 in 2 rooms
 STATIONS served at same time, max 2-3
 MAG SPECTROGRAPH, type
 COMPUTER model EC-1040, EC-1010, H.P.
 OTHER FACILITIES Isotope production M-5, M-6, MU
 Medico-Biological complex, YASNAPP

CHARACTERISTIC BEAMS

PARTICLE	ENERGY (MeV)		CURRENT (μA)	
	Goal	Achieved	Internal	External
p	700	50	35

SECONDARY

.....	6.6 · 10 ⁷ (part/s)
.....	8 · 10 ⁸
.....	7 · 10 ⁷

BEAM PROPERTIES

MEASURED		CONDITIONS	
PULSE WIDTH	RF deg	μA of	MeV ions
PHASE EXC, max	RF deg	μA of	MeV ions
EXTRACT eff	%	μA of	MeV ions
RESOL ΔE/E	%	μA of	MeV ions
EMITTANCE			

(π mm. mrad) { axial } μA of MeV ions
 { rad }

OPERATING PROGRAMS, time distribution

BASIC NUCLEAR PHYSICS SOLID STATES PHYSICS
 BIOMEDICAL APPLICAT. ISOTOPE PRODUCTIONS

REFERENCES/NOTES**PLAN VIEW OF FACILITY, NOTEWORTHY FEATURES, COMMENTS**