

ENTRY NO. FM3 Date 1 Sept. 1995
 Name of Machine JINR PHASOTRON
 Institution Joint Institute for Nuclear Research, Laboratory of Nuclear Problems
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HISTORY
MILESTONE DATES:
 Design 1967 Model Tests 1968-1974
 Construction 1979-1984 First Beam 1984
DESIGN/CONSTRUCTION BY:
 in house JINR other EFREMOV INSTITUTE 6
COST: Accelerator Facility 18.10 roubles
FUNDED BY: JINR

STATUS
STAFF: Machine
 Scientists 15 Engineers 24
 Technicians 41 Students
 Research (in house/external)
 Scientists / Engineers /
 Technicians / Students /
BUDGET: Machine Funded by
 Research Funded by
TIME DISTRIBUTION:
 Basic Research (in house/external) 40 % / 20 %
 Applied Program (in house/external) 15 % / %
 Maintenance 19 % Development 6 %

MAGNET
POLE PARAMETERS:
 Diameter 600 cm R_{extract} 270 cm R_{inject} cm
HILL PARAMETERS: Gap (min) 15 cm B_{max} 1.8 T
 (@ AT) Gap (max) 30 cm B_{min} T
VALLEY PARAMETERS: Gap (min) cm B_{max} 1.2 T
 (@ AT) Gap (max) cm B_{min} T
AVERAGE FIELD: $\langle B \rangle_{\text{min}}$ 1.2 T $\langle B \rangle_{\text{max}}$ 1.63 T
NUMBER OF SECTORS: compact/separated /
 sector angle deg. spiral (max) 77 deg.
FIELD TRIMMING: Trim Coils
 Harmonic Coils
 Other
CURRENT: Main Coils 4000 Amps Stability $2 \cdot 10^{-4}$
 Trim Coils Amps Stability
 Stored Energy (cryogenic) MJ
WEIGHT: Iron 7000 tons Conductor 165 tons
ION ENERGY: Bending Limit $E/A =$ q²/A² MeV/u
 Focusing Limit $E/A =$ q/A MeV/u

ACCELERATION SYSTEM
FUNDAMENTAL ACCELERATION:
 Description: 180° DEE
 No. of Gaps/turn 2 dE/dn(max) MeV/q
 Voltage (max) 0.04 MV Harmonic f_H/f_{ion}
 Freq. 18.6±14.4 MHz Power in(max) 0.3 MW
 Stability: Phase Voltage
OTHER CAVITIES (Flattopping or otherwise):
 Description: C-electrode 60°
 Region of Influence: R_{min} 259 cm R_{max} 274 cm
 No. of Gaps/turn 2 dE/dn(max) 0.02 MeV/q
 Voltage (max) 0.02 MV Harmonic f_H/f_{ion}
 Freq. 14.56±14.52 MHz Power in(max) 0.01 MW
 Stability: Phase Voltage

VACUUM SYSTEM
OPERATING PRESSURE: $2 \cdot 10^{-6}$ Torr
PUMPS: (No. and type) 5 diffusion pumps
 with nitrogen baffles

ION SOURCE(S)
 Type Intensity (mA) @ $\epsilon_n = \beta\gamma\epsilon$ (mm mrad) Ion Species
 (a) internal
 (b) pig type
 (c)
 (d)

INJECTION SYSTEM
 Efficiency %

EXTRACTION SYSTEM
 regenerative extraction Efficiency 50 %
 Iron-current channel
CHARACTERISTIC BEAMS

Accelerated Ions	E/A (MeV/u)	Current (part μ A)	
		Internal	External
(a) p	680	7	3.5
(b)			
(c)			
(d)			

Secondary Particles	E (MeV)	part/sec
(a) π^-	40	$3 \cdot 10^6/\mu$ A
(b) μ^-	60	$3 \cdot 10^5/\mu$ A
(c) μ^+	4	$5 \cdot 10^5$

EXTRACTED BEAM PROPERTIES:
 For 2 μ A of .665 MeV/u p. ions
 $\Delta E/E$ 1.5 % $\Delta\phi$ °rf
 $\epsilon_n = \beta\gamma\epsilon$ x 5.1 π mm mrad z 3.4 π mm mrad

FACILITIES FOR RESEARCH
SHIELDED AREA: Fixed: 1500 m² Moveable m²
 Target Stations: 4±7 No. Served At Same Time: 2±3
MAGNETIC SPECTROMETERS:
OTHER FACILITIES: 1. Medico-Biological Complex
 2. Proton therapy
 3. YASNAPP (ISOL)

REFERENCES/NOTES
 (a) PHASOTRON and Its Beams, JINR, E9-92-232
 (b)

PLAN VIEW OF FACILITY, COMMENTS

