

ENTRY NO. C11 Date September 30 / 1995
 Name of Machine U-120M
 Institution Nuclear Physics Institute
 Address 250 68 REZ near Prague, Czech republic
 Tel +422 66173614 Telex Fax +422 6657003 E-MAIL STURSA@UJF.CAS.CZ
 In Charge: J. STURSA Reported by: J. STURSA

HISTORY

MILESTONE DATES:
 Design 1972 Model Tests 1975
 Construction First Beam August 1977
 DESIGN/CONSTRUCTION BY:
 in house no other JINR Dubna Russia
 COST: Accelerator 1.2 M\$ Facility
 FUNDED BY: Czech Academy of Sciences

STATUS

STAFF: Machine
 Scientists 3 Engineers 5
 Technicians 10 Students
 Research (in house/external)
 Scientists / Engineers /
 Technicians / Students /
 BUDGET: Machine Funded by
 Research Funded by
 TIME DISTRIBUTION:
 Basic Research (in house/external) 29 % / 2 %
 Applied Program (in house/external) % / 55 %
 Maintenance 7 % Development 7 %

MAGNET

POLE PARAMETERS:
 Diameter 120 cm R_{extract} 50 cm R_{inject} 1.8 cm
 HILL PARAMETERS: Gap (min) 8.2 cm B_{max} 1.80 T
 (@ AT) Gap (max) 12.0 cm B_{min} 2.05 T
 VALLEY PARAMETERS: Gap (min) 22 cm B_{max} 1.72 T
 (@ AT) Gap (max) 22 cm B_{min} 1.61 T
 AVERAGE FIELD: $\langle B \rangle_{\text{min}}$ 1 T $\langle B \rangle_{\text{max}}$ 1.85 T
 NUMBER OF SECTORS: compact/separated 4 /
 sector angle deg. spiral (max) 70 deg.
 FIELD TRIMMING: Trim Coils 18
 Harmonic Coils 1 (first harm.)
 Other
 CURRENT: Main Coils 600 Amps Stability $1e-5$
 Trim Coils 500 Amps Stability $1e-3$
 Stored Energy (cryogenic) MJ
 WEIGHT: Iron 110 t Conductor 11.6 t
 ION ENERGY: Bending Limit $E/A = 40 \text{ q}^2/A^2 \text{ MeV/u}$
 Focusing Limit $E/A = \text{q/A MeV/u}$

ACCELERATION SYSTEM

FUNDAMENTAL ACCELERATION:
 Description: 1 dee 180
 No. of Gaps/turn 2 $dE/dn(\text{max})$ 0.07 MeV/q
 Voltage (max) 0.035 MV Harmonic $f_{\text{rf}}/f_{\text{ion}}$ 1
 Freq 10-26 MHz Power in(max) 0.1 MW
 Stability: Phase Voltage $5e-3$
 OTHER CAVITIES (Flattopping or otherwise):
 Description:
 Region of Influence: R_{min} cm R_{max} cm
 No. of Gaps/turn $dE/dn(\text{max})$ MeV/q
 Voltage (max) MV Harmonic $f_{\text{rf}}/f_{\text{ion}}$
 Freq MHz Power in(max) MW
 Stability: Phase Voltage

VACUUM SYSTEM

OPERATING PRESSURE: $1.3 \cdot 10^{-3} \text{ Pa}$ / $1.7 \cdot 10^{-4} \text{ Pa}$
 PUMPS: (No. and type) with int. IS / with ext. IS
 2x6300l/s diff.pumps

ION SOURCE(S)

Type	Intensity (mA)	@ $\epsilon_n = \beta \gamma c$ ($\pi \text{ mm mrad}$)	Ion Species
(a) Internal PIG	0.6		$\text{H}^+, \text{D}^+, \text{He}^{++}$
(b) Internal PIG	0.05		$^3\text{He}^{++}, ^4\text{He}^{++}$
(c) CUSP	1	0.15	$\text{H}^+, \text{He}^{++}$
(d) (being installed)			

INJECTION SYSTEM

Axial injection, Efficiency 12-40 %
 spiral inflec.

EXTRACTION SYSTEM

Magnetic regenerator, Efficiency 30 %
 3 electrostatic defl. sections

CHARACTERISTIC BEAMS

Accelerated Ions	E/A (MeV/u)	Current (part μA)	Internal	External
(a) p	37	100	4-10	
(b) d	10	100	4-10	
(c) $^3\text{He}^{++}$	18	20	2-6	
(d) $^4\text{He}^{++}$	10	20	2-6	

Secondary Particles	E (MeV)	part/sec
(a) neutrons	6	10 ¹²
(b)		
(c)		

EXTRACTED BEAM PROPERTIES:

For 10 μA of 30 MeV/u p ions
 $\Delta E/E$ 1 % $\Delta \phi$ 40 °
 $\epsilon_n = \beta \gamma c$ x 11 $\pi \text{ mm mrad}$ z 2.5 $\pi \text{ mm mrad}$

FACILITIES FOR RESEARCH

SHIELDED AREA: Fixed: 265 m² Moveable 0 m²
 Target Stations: 8 No. Served At Same Time: 1
 MAGNETIC SPECTROMETERS: $R=0.8 \text{ m}$, 124 deg.
 $\Delta E/E=5 \cdot 10^{-4}$
 OTHER FACILITIES:
 Multichannel magnetic analyzer $E/\Delta E=2500$
 Achromatic magnetooptical system (AMOS) 90°, 5m

REFERENCES/NOTES

(a) J. Stursa, et al. Proc. EPAC 92, Berlin
 (b)

PLAN VIEW OF FACILITY, COMMENTS

