

ENTRY NO. **C 47** Date November 27, 1995
 Name of Machine V - 200P Cyclotron
 Institution Heavy Ion Laboratory, Warsaw University
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 In Charge: J. KOWNACKI Reported by: T CZOSNYKA

HISTORY
MILESTONE DATES:
 Design 1978 Model Tests
 Construction 1989 Final site First Beam 1993
DESIGN/CONSTRUCTION BY:
 in house Yes other Ins Swierk, JINR Dubna
COST: Accelerator Facility
FUNDED BY: Ministry of Education,
 State Comm. for Sci. Research,
 Warsaw University

STATUS
STAFF: Machine
 Scientists 3 Engineers 18
 Technicians 21 Students ---
 Research (in house/external)
 Scientists 10 / ~20 Engineers /
 Technicians / Students / ~10
BUDGET: Machine Total Funded by As above
 Research 3 MLN PLN Funded by

TIME DISTRIBUTION:
 Basic Research (in house/external) 10 % / 10 %
 Applied Program (in house/external) 5 % / 10 %
 Maintenance 15 % Development 50 %

MAGNET
POLE PARAMETERS:
 Diameter 200 cm $R_{extract}$ 85 cm R_{inject} cm
HILL PARAMETERS: Gap (min) 2.7 cm B_{max} 2.63 T
 (@ AT) Gap (max) 5.15 cm B_{min} 2.5 T
VALLEY PARAMETERS: Gap (min) 15.2 cm B_{max} 1.7 T
 (@ AT) Gap (max) 15.2 cm B_{min} 1.6 T
AVERAGE FIELD: $\langle B \rangle_{min}$ 1.8 T $\langle B \rangle_{max}$ 2.1 T
NUMBER OF SECTORS: compact/separated / 4
 sector angle 42 deg. spiral (max) deg.
FIELD TRIMMING: Trim Coils 10 pairs
 Harmonic Coils
 Other
CURRENT: Main Coils 1300 Amps Stability 10^{-4}
 Trim Coils 300 Amps Stability $4 \cdot 10^{-4}$
 Stored Energy (cryogenic) MJ
WEIGHT: Iron 240 tonnes Conductor 30 tonnes
ION ENERGY: Bending Limit E/A = 160 q²/A² MeV/u
 Focusing Limit E/A = 36 q/A MeV/u

ACCELERATION SYSTEM
FUNDAMENTAL ACCELERATION:
 Description: 2.45 Degrees Dees
 No. of Gaps/turn 4 $dE/dn(max)$ 0.3 MeV/q
 Voltage (max) 0.076 MV Harmonic f_r/f_{ion} 1, 2, 3, 4
 Freq 12.721 MHz Power in(max) 2×0.12 MW
 Stability: Phase 1 Deg. Voltage 10^{-4}
OTHER CAVITIES (Flattopping or otherwise):
 Description:
 Region of Influence: R_{min} cm R_{max} cm
 No. of Gaps/turn $dE/dn(max)$ MeV/q
 Voltage (max) MV Harmonic f_r/f_{ion}
 Freq MHz Power in(max) MW
 Stability: Phase Voltage

VACUUM SYSTEM
OPERATING PRESSURE: $5 \cdot 10^{-6}$ Torr
PUMPS: (No. and type) 4 SP-6000 Pumps
 1700 L/s each

ION SOURCE(S)
 Type Intensity @ $\epsilon_n = \beta\gamma\epsilon$ Ion Species
 (mA) (π mm mrad)
 (a) PIG ion dependant He-Ar₁ gas
 (b) ECR under development
 (c)
 (d)

INJECTION SYSTEM
 Efficiency %

EXTRACTION SYSTEM
 Stripping Efficiency %

CHARACTERISTIC BEAMS
 Accelerated Ions E/A (MeV/u) Current (part μ A)
 Internal External
 (a) $^{12}C^{2+}$ 3-4 ~0.5
 (b) $^{16}O^{3+}$ 4-5 ~2 ~0.5
 (c)
 (d)

Secondary Particles E (MeV) part/sec
 (a)
 (b)
 (c)

EXTRACTED BEAM PROPERTIES:
 For μ A of MeV/u ions
 $\Delta E/E$ % $\Delta\phi$ °rf
 $\epsilon_n = \beta\gamma\epsilon$ \times π mm mrad z π mm mrad

FACILITIES FOR RESEARCH
 SHIELDED AREA: Fixed: 30 m² Moveable 1300 m²
 Target Stations: 7 No. Served At Same Time: 1

MAGNETIC SPECTROMETERS:
OTHER FACILITIES:

REFERENCES/NOTES
 (a)
 (b)

PLAN VIEW OF FACILITY, COMMENTS
 Operations restricted to the beams below or around the
 coulomb barrier (3 and 4 Harmonics) until radiation
 protection system is completed.