ENTRY No. C43

NAME OF MACHINE U-200 DATE

INSTITUTION Joint Institute for Nuclear Research

ADDRESS Dubna, USSR

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IN CHARGE Yu.Ts. Oganessian REPORTED BY G.G. Gulbekian

HISTORY AND STATUS

DESIGN, date 1966 Model tests

ENG DESIGN, date 1966-67

CONSTRUCTION, date 1966-67

FIRST BEAM, date (or goal) 1968

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 30 hr/wk, On target 25 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) 200 cm, R extraction 86. cm

R injection cm

GAP, min 3 cm, Field 26 kG
max 15 cm, Field 24 kG
at 0.59×10^6 Ampere turns

AVERAGE FIELD at R ext 20 kG

B max/ <B> 1.3

NUMBER OF SECTORS compact 4, separated ; Spiral, max deg

SECTOR ANGLE (SSC) deg

TRIMMING COILS 7 circular
4 harmonic

CONDUCTOR, material and type Cu

STORED ENERGY (cryogenic) MJ

POWER : main coils 350 max, kW ; current stability 10^{-4}
trimming coils 20 max, kW ; current stability 10^{-3}

WEIGHT : Fe 220 tons ; coils 11.5 tons

COOLING system Demineralized water

ION ENERGY (bending limit) E/A = 145 q^2/a^2 MeV/amu
(focusing limit) E/A = 20 q^2/a^2 MeV/amu

ACCELERATION SYSTEM

DEES, number 2,429 ; angle deg

BEAM APERTURE 2.5 cm ; DC Bias 0 kV

TUNED by, coarse MS fine VC

RF 12 to 21.5 mHz, stable ± 10^{-5}

Orb F 3 to 10.7 mHz

HARMONICS, RF/Orb F, used 2,3

DEE - Gnd, max 75 kV, min gap 4 cm

STABILITY, (pk-pk noise)/(pk RF volt) 10^{-2}

ENERGY GAIN, max 275 kV/turn

RF PHASE, stable to ± 4 deg

RF POWER input, max 50 kW

FREQUENCY MODULATION, rate /s

modulator, type

beam pulse, width

VACUUM SYSTEM

OPERATING PRESSURE 2×10^{-6} Torr or mbar

PUMPS, No, Type, Size 2 oil diffusion pumps
4000 l/s each

ION SOURCES

Arc type with heated cathode

INJECTION SYSTEM

EXTRACTION SYSTEM

Stripping + magnetic channel

FACILITIES FOR RESEARCH

SHIELDED AREA, fixed 225 m² ; movable m²

TARGET STATIONS 4 in 2 rooms

STATIONS served at same time, max 1

MAG SPECTROGRAPH, type

COMPUTER model

OTHER FACILITIES

CHARACTERISTIC BEAMS

PARTICLE	ENERGY (MeV) Goal	Achieved	CURRENT (pμA) Internal	External
$^4He^{1+}$	39	37	600	60
$^{12}C^{3+}$	208	198	20	10
$^{40}Ar^{8+}$	230	220	0.012	0.006
SECONDARY				(part/s)

BEAM PROPERTIES

MEASURED	CONDITIONS
PULSE WIDTH 30. RF deg	pμ A of MeV ions
PHASE EXC, max RF deg	pμ A of MeV ions
EXTRACT eff 40-100. %	pμ A of MeV ions
RESOL ΔE/E 1. %	pμ A of MeV ions

EMITTANCE

(π mm. mrad) { 30 axial, 70 rad } 5 pμA of 37 MeV ions

OPERATING PROGRAMS, time distribution

BASIC NUCLEAR PHYSICS 100% SOLID STATES PHYSICS

BIOMEDICAL APPLICAT. ISOTOPE PRODUCTIONS

REFERENCES/NOTES

1) Proc.of the VIth Int.Cyclotron Conf., New York;232,1972

PLAN VIEW OF FACILITY, NOTEWORTHY FEATURES, COMMENTS