

ENTRY No. C44

NAME OF MACHINE U-400 M DATE  
INSTITUTION Joint Institute for Nuclear Research, Laboratory of Nuclear Reactions  
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IN CHARGE Yu.Ts. Oganessian REPORTED BY G.G. Gulbekian

#### HISTORY AND STATUS

DESIGN, date Model tests  
ENG DESIGN, date 1985-1987  
CONSTRUCTION, date 1987-1990  
FIRST BEAM, date (or goal) 1991  
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 hr/wk, On target 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) 400. cm, R extraction 175 cm  
R injection cm  
GAP, min 10. cm, Field 25.5. kG }  
max 50. cm, Field 14. kG } at 1.26.10<sup>6</sup>  
AVERAGE FIELD at R ext 19.5. kG } Ampere turns  
B max/ <B> 1.3

NUMBER OF SECTORS { compact 4. } Spiral, max 40. deg  
separated . . . . . }  
SECTOR ANGLE (SSC) . . . . . 45. deg

TRIMMING COILS . . . . . 15. circular  
5. harmonic

CONDUCTOR, material and type . . . . . Copper  
STORED ENERGY (cryogenic) . . . . . MJ  
POWER: main coils 750. max, kW; current stability 10<sup>-4</sup>  
trimming coils 120. max, kW; current stability 10<sup>-3</sup>

WEIGHT: Fe 2100. tons; coils 115. tons  
COOLING system . . . . . Demineralized water

ION ENERGY (bending limit) E/A = .540. q<sup>2</sup>/a<sup>2</sup> MeV/amu  
(focusing limit) E/A = .120. q<sup>2</sup>/a<sup>2</sup> MeV/amu

#### ACCELERATION SYSTEM

DEES, number 4; angle 45. deg  
BEAM APERTURE 10. cm; DC Bias 0. kV  
TUNED by, coarse MS. fine VC  
RF 11.5. to 25. MHz, stable ± 10<sup>-5</sup>  
Orb F 5.75. to 12.5. MHz

HARMONICS, RF/Orb F, used 2  
DEE - Gnd, max 150-200V, min gap .18. cm  
STABILITY, (pk-pk noise)/(pk RF volt) . . . . . 10<sup>-3</sup>

ENERGY GAIN, max . . . . . 1200. kV/turn  
RF PHASE, stable to ± . . . . . deg  
RF POWER input, max . . . . . 4x100. kW  
FREQUENCY MODULATION, rate . . . . . /s  
modulator, type  
beam pulse, width

#### VACUUM SYSTEM

OPERATING PRESSURE . . . . . (0,5-1).10<sup>-6</sup> Torr or mbar  
PUMPS, No, Type, Size . . . . . 20000. l/s. for N

#### ION SOURCES

U-400, PIG with heated cathode, ECR

#### INJECTION SYSTEM

Carbon stripper after radial injection

#### EXTRACTION SYSTEM

electrostatic deflector, magnetic channel

#### FACILITIES FOR RESEARCH

SHIELDED AREA, fixed .1500. m<sup>2</sup>; movable m<sup>2</sup>

TARGET STATIONS .10. In rooms

STATIONS served at same time, max .1.

MAG SPECTROGRAPH, type

COMPUTER model

OTHER FACILITIES

#### CHARACTERISTIC BEAMS

PARTICLE	ENERGY (MeV)		CURRENT (pA)	
	Goal	Achieved	Internal	External
16O	1920			
238U	4760			

#### SECONDARY

(part/s)

#### BEAM PROPERTIES

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

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

OPERATING PROGRAMS, time distribution  
BASIC NUCLEAR PHYSICS .. SOLID STATES PHYSICS  
BIOMEDICAL APPLICAT. .... ISOTOPE PRODUCTIONS

#### REFERENCES/NOTES

1) Proc. of the X Int. Conf. on Cycl. and their Appl.,  
1984, East Lansing, USA, p.317

#### PLAN VIEW OF FACILITY, NOTEWORTHY FEATURES, COMMENTS