ENTRY NO. 127

NAME OF MACHINE U-400M
INSTITUTION Joint Institute for Nuclear Research, Laboratory of Nuclear Reactions
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IN CHARGE G.N.Flerov REPORTED BY

HISTORY AND STATUS

DESIGN, date ... Model tests ...
ENG DESIGN, date 1984-1986
CONSTRUCTION, date 1985-1988
FIRST BEAM, date (or goal) 1989
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 $1.26.10^6$
AVERAGE FIELD at R ext 19.5 kG Ampere turns
B max/<B> 1.3
NUMBER OF SECTORS compact 4 / separated - Spiral, max 40 deg
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^{-4}
trimming coils 120 max kW: current stability 10^{-3}
WEIGHT: Fe 2100 tons: coils 115 tons
COOLING system Demineralized water
ION ENERGY (Bending limit) E/A = 540 q^2/A^2 MeV/amu
(Focusing limit) E/A = 120 q/A 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^{-5}
Orb F 5.75 to 12.5 MHz
HARMONICS, RF/Orb F, used 2
DEE–Gnd, max 150-200 kV, min gap 18 cm
STABILITY, (pk-pk noise)/(pk RF volt) 10^{-3}
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 $(0.5-1).10^{-6}$ Torr or mbar
PUMPS, No, Type, Size
20000 l/s for N

ION SOURCES

U-400, PIG with heated cathode

INJECTION SYSTEM

Carbon stripper after radial injection

EXTRACTION SYSTEM

electrostatic deflector, magnetic channel

FACILITIES FOR RESEARCH

SHIELDED AREA, fixed 1500 m²; movable ... m²
TARGET STATIONS 10 in ... 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
^{16}O				
^{238}U	1920			
	4760			
SECONDARY			(part/s)	

BEAM PROPERTIES

MEASURED		CONDITIONS		
PULSE WIDTH	RF deg	pμ A of	MeV	ions
PHASE EXC. max	RF deg	pμ A of	MeV	ions
EXTRACT eff	%	pμ A of	MeV	ions
RESOL ΔE/E	%	pμ A of	MeV	ions
EMITTANCE				
(π mm-mrad)	axial	pμ A of	MeV	
	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
2) Appl., 1984, East Lansing, USA, p.317

PLAN VIEW OF FACILITY, COMMENTS, ETC.