ENTRY NO. 11

NAME OF MACHINE Heavy Ion Research Facility of Lanzhou (HIRFL) DATE Aug. 81

INSTITUTION Institute of Modern Physics, Academia Sinica (IMP)

ADDRESS P.O. Box 31, Lanzhou, China

TEL TELEX

IN CHARGE C.Z. Yang REPORTED BY HIRFL Staff

HISTORY AND STATUS

DESIGN, date 1976 - 1980 Model tests 1975 - 1979

ENG DESIGN, date 1979 - 1982

CONSTRUCTION, date 1982 - 1987

FIRST BEAM, date (or goal) 1987

MAJOR ALTERATIONS

COST, ACCELERATOR Approx. 77 Million Yuans

COST, FACILITY, total

FUNDED BY Chinese Government

ACCELERATOR STAFF, OPERATION AND DEVELOPMENT

SCIENTISTS 20 ENGINEERS 30

TECHNICIANS 50 CRAFTS 20

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 Chinese Government

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) 717 cm, R extraction 321 cm

R injection 100 cm

GAP, min 10 cm, Field 16 kG

min 10 cm, Field 16 kG at .17 X 10^6 Ampere turns

AVERAGE FIELD at R ext 9.58 kG

B max/ < B > 1.67

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

SECTOR ANGLE (SSC) 52 deg

TRIMMING COILS 36 Pairs

CONDUCTOR, material and type Copper

STORED ENERGY (cryogenic) MJ

POWER: main coils 552. max, kW; current stability $5x10^{-6}$

trimming coils 138. max, kW; current stability $5x10^{-5}$

WEIGHT: Fe 2000 tons; coils 15.6 tons

COOLING system Demineralized water

ION ENERGY (bending limit) E/A = 450 q^2/a^2 MEV/amu

(focusing limit) E/A = q/a MeV/amu

ACCELERATION SYSTEM

DEES, number 2 ; angle 30 deg

BEAM APERTURE 5 cm; DC Bias kV

TUNED by, coarse Panel fine Plunger

RF 6.5 to 14.0 mHz, stable ± $2x10^{-6}$

Orb F 1.40 to 6.38 mHz

HARMONICS, RF/Orb F, used 2 - 10

DEE—Gnd, max 250 kV, min gap 6 cm

STABILITY, (pk-pk noise)/(pk RF volt) 1×10^{-3}

ENERGY GAIN, max 1000 kV/turn

RF PHASE, stable to ± .5 deg

RF POWEP input, max 2x120=240 kW

FREQUENCY MODULATION, rate /s

modulator, type

beam pulse, width

VACUUM SYSTEM

OPERATING PRESSURE $1x10^{-7}$ Torr or mbar

PUMPS, No, Type, Size 4 turbin Pumps 3500L/S

10 Cryo Pumps 800, 20000 L/S

ION SOURCES

PIG

INJECTION SYSTEM 1.7m SFC injector

Stripper between injector and SSC

EXTRACTION SYSTEM electrostatic deflector + magnetic channel + bending magnet

FACILITIES FOR RESEARCH

SHIELDED AREA, fixed m^2; movable m^2

TARGET STATIONS in

STATIONS served at same time, max

MAG SPECTROGRAPH, type

COMPUTER model

OTHER FACILITIES

CHARACTERISTIC BEAMS

PARTICLE	ENERGY (MeV) Goal	Achieved	CURRENT (pμA) Internal	External
C	100		0.06	
Ar	46		0.04	
Kr	10		0.003	
Xe	4.8		0.002	
SECONDARY		(part/s)		

BEAM PROPERTIES

	MEASURED	CONDITIONS
PULSE WIDTH	9 RF deg	0.06pμ A of 100 MeV/A C^{6+} ions
PHASE EXC. max	RF deg	pμ A of MeV ions
EXTRACT eff	90 %	0.06pμ A of 100 MeV/A C^{6+} ions
RESOL ΔE/E	0.5 %	0.06pμ A of 100 MeV/A C^{6+} ions
EMITTANCE (π mm. mrad)	10 axial ; 10 rad	0.06pμ A of 100 MeV/A C^{6+} ions

OPERATING PROGRAMS, time distribution

BASIC NUCLEAR PHYSICS SOLID STATES PHYSICS

BIOMEDICAL APPLICAT ISOTOPE PRODUCTIONS

REFERENCES/NOTES HIRFL group, Proc. Japan-China joint symposium On accelerators for nuclear science and their applications Atami, 8-11 Sept. 1980 P390.

PLAN VIEW OF FACILITY, COMMENTS, ETC.