ENTRY No. 11

NAME OF MACHINE Heavy Ion Research Facility of Lanzhou (HIRFL) DATE Aug. 81
INSTITUTION Institute of Modern Physics, Academia Sinica (IMP)
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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
max 10 cm, Field 16 kG
at $.17 \times 10^6$ 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 5×10^{-6}
trimming coils 138 max, kW ; current stability 5×10^{-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 ± 2×10^{-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 POWER input, max 2X120=240 kW
FREQUENCY MODULATION, rate /s
modulator, type
beam pulse, width

VACUUM SYSTEM
OPERATING PRESSURE 1×10^{-7} Torr or mbar
PUMPS, No, Type, Size 4 turbo Pumps 3500L/S

10 Cryo Pumps Ø 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 ..... m² ; movable ..... m²
TARGET STATIONS ..... in ..... rooms
STATIONS served at same time, max
MAG SPECTROGRAPH, type
COMPUTER model
OTHER FACILITIES

CHARACTERISTIC BEAMS

PARTICLE	ENERGY (MeV / A) 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	0.06 pμ A of 100 MeV/A C^{6+} ions
PHASE EXC, max	RF deg	pμ A of MeV
EXTRACT eff	90 %	0.06 pμ A of 100 MeV/A C^{6+} ions
RESOL ΔE/E	0.5 %	0.06 pμ A of 100 MeV/A C^{6+} ions
EMITTANCE (π mm. mrad)	10 axial, 10 rad	0.06 pμA 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. HIRFL group, Present status of HIRFL, this conference.

PLAN VIEW OF FACILITY, NOTEWORTHY FEATURES, COMMENTS