

ENTRY NO. 14

NAME OF MACHINE ... Heavy Ion Research Facility, Lanzhou (HIRFL)
 INSTITUTION ... Institute of Modern physics, Academia Sinica (IMP)
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 IN CHARGE ... C.Z. Yang ... REPORTED BY ... B.W. Wei

HISTORY AND STATUS

DESIGN, date ... 1976 ... Model tests ... 1979
 ENG DESIGN, date ... 1982
 CONSTRUCTION, date ... 1982 - 1988
 FIRST BEAM, date (or goal) ... 1988
 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) ... 717 ... cm, R-extraction ... 321 ... cm
 R injection ... 100 ... cm
 GAP, min ... 10 ... cm, Field ... 16 ... kG
 max ... 10 ... cm, Field ... 16 ... kG } at ... 0.17 10⁶
 AVERAGE FIELD at R ext ... 2.58 ... kG } Ampere turns
 B max / < B > ... 1.67
 NUMBER OF SECTORS { compact ... } Spiral, max ... deg
 SECTOR ANGLE (SSC) ... 52 ... deg
 TRIMMING COILS ... 36

CONDUCTOR, material and type copper, mineral insulated

STORED ENERGY (cryogenic) ... MJ
 POWER: main coils 552 ... max kW: current stability 5. 10⁻⁵
 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 ... q²/A² 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 Wave panel ... fine Rotating trimmer
 RF ... 6.5 ... to ... 14 ... MHz, stable ± 2 10⁻⁶
 Orb F ... 1.4 ... to ... 6.38 ... MHz
 HARMONICS, RF/Orb F, used ... 2-10
 DEE-Gnd, max ... 250 ... kV, min gap ... 3.6 ... cm
 STABILITY, (pk-pk noise)/(pk RF volt) ... 10⁻⁷
 ENERGY GAIN, max ... 1000 ... kV/turn
 RF PHASE, stable to ± ... 0.5 ... deg
 RF POWER input, max ... 240 ... kW
 FREQUENCY MODULATION, rate ... /s
 modulator, type
 beam pulse, width

VACUUM SYSTEM

OPERATING PRESSURE ... 10⁻⁷ ... Torr or mbar
 PUMPS, No, Type, Size
 2 turbo pumps, TPH 5000
 8 cryopumps, RKP 800

ION SOURCES

PIG, ECR

INJECTION SYSTEM

2 bending magnets + 2 magnetic channels + 1 deflector

EXTRACTION SYSTEM

2 magnetic channels + bump + 1 deflector + 2 bending magnets

FACILITIES FOR RESEARCH

SHIELDED AREA, fixed ... m²; movable ... m²
 TARGET STATIONS ... 8 ... in experimental rooms
 STATIONS served at same time, max
 MAG SPECTROGRAPH, type
 COMPUTER model
 OTHER FACILITIES

CHARACTERISTIC BEAMS

PARTICLE	ENERGY (MeV)		CURRENT (pA)	
	Goal	Achieved	Internal	External
C	100			
Ar	46			
Kr	10			
Xe	4.8			
SECONDARY			(part/s)	

BEAM PROPERTIES

	MEASURED		CONDITIONS	
	RF deg	μA of	MeV	ions
PULSE WIDTH				
PHASE EXC, max				
EXTRACT eff				
RESOL ΔE/E	0.5 %			
EMITTANCE				
(π mrad)	4 axial			
	4 rad			

OPERATING PROGRAMS, time distribution

BASIC NUCLEAR PHYSICS ... SOLID STATES PHYSICS
 BIOMEDICAL APPLICAT ... ISOTOPE PRODUCTIONS

REFERENCES/NOTES

- 1)
- 2)

PLAN VIEW OF FACILITY, COMMENTS, ETC.

