

ENTRY NO. 91

NAME OF MACHINE Electron Model, Relativistic Ring Cyclot DATE August, 1978
 INSTITUTION Joint Institute for Nuclear Research, Lab. Nucl. Probl.
 ADDRESS JINR, Head Post Office, POB 79, Moscow, USSR

IN CHARGE Prof. V.P. DZHELEPOV REPORTED BY Prof. V.P. DZHELEPOV

HISTORY AND STATUS

DESIGN, date 1964 MODEL tests 1964-66
 ENG. DESIGN, date 1966-67
 CONSTRUCTION, date 1967
 FIRST BEAM date (or goal) 1967
 MAJOR ALTERATIONS 1974, 1977

OPERATION, 25 hr/wk; On Target _____ hr/wk
 TIME DIST., in house 100 %, outside _____ %
 USERS' SCHEDULING CYCLE _____ weeks
 COST, ACCELERATOR _____
 COST, FACILITY, total _____
 FUNDED BY _____

ACCELERATOR STAFF, OPERATION and DEVELOPMENT

SCIENTISTS 1 ENGINEERS 2
 TECHNICIANS 2 CRAFTS 2
 GRAD STUDENTS involved during year _____
 OPERATED BY _____ Res staff or _____ Operators
 BUDGET, op & dev _____
 FUNDED BY _____

RESEARCH STAFF, not included above

USERS, in house 14 outside _____
 GRAD STUDENTS involved during year _____
 RES. BUDGET, in house _____
 FUNDED BY JINR

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 _____

REFERENCES/NOTES

MAGNET

POLE FACE diameter 240 cm; R extraction 101 cm
 GAP, min 8 cm; Field _____ kG } at _____ X 10⁶
 max 8 cm; Field _____ kG }
 AVERAGE FIELD at R ext 24 kG } ampere turns
 CURRENT STABILITY 100 parts/10⁶; B_{max}/⟨B⟩ 2.06
 NUMBER OF SECTORS 8; SPIRAL, max 60 deg
 POLE FACE COIL PAIRS: AVF _____ /sec;
 Harmonic correction _____
 Rad grad _____ /sec or Circ coils _____
 WEIGHT: Fe _____ tons; Coils _____ tons
 CONDUCTOR, Material and type Cu
 STORED ENERGY _____ MJ
 COOLING SYSTEM H₂O
 POWER: Main coils 80 max, kW
 Trimming coils 20 max, kW
 YOKE/POLE AREA _____ %
 SECTOR ANGLE (Sep Sec) _____ deg
 ION ENERGY (Bending limit) E/A = _____ q²/A² MeV
 (Focusing limit) E/A = _____ q/A MeV

ACCELERATION SYSTEM

DEES, number 2 angle 45 deg
 BEAM APERTURE 2 cm; DC BIAS _____ kV
 TUNED by, coarse MS fine VC, auto
 RF 39.5 to _____ MHz, stable ± 5 /10⁶
 Orb F 39.5 to _____ MHz; GAIN, max 2 kV/turn
 HARMONICS, RF/Orb F, used 1
 DEE-Gnd, max _____ kV, min gap _____ cm
 STABILITY, (pk-pk noise)/(pk RF volt) 5×10
 RF PHASE stable to ± 5 deg
 RF POWER input, max 40 kW
 RF PROTECT circuit, speed _____ μsec
 Type _____
 FREQUENCY MODULATION, rate _____ /sec
 MODULATOR, type _____
 BEAM PULSE, width _____

VACUUM SYSTEM

PUMPS, No., Type, Size 9 diffusion pumps
 OPERATING PRESSURE 1 μTorr,
 PUMPDOWN TIME 2 hrs

ION SOURCES/INJECTION SYSTEM

Electron injector (6 keV)

EXTRACTION SYSTEM

closed orbit expansion

CONTROL SYSTEM

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CHARACTERISTIC BEAMS

	Particle	Goal (MeV)	Achieved (MeV)
ENERGY	e	0.4	
CURRENT		(μ A)	(μ A)
Internal		1000	
External			
		(part/s)	(part/s)
Secondary			

BEAM PROPERTIES

	Measured	Conditions
Pulse Width	20 RF deg	10^2 μ A of 0.4 MeV
Phase Exc, max	RF deg	μ A of MeV
Extract Eff	100 %	μ A of MeV
Res, $\Delta E/E$	%	μ A of MeV
Emittance	(mm-mrad) { axial } μ A of MeV	
	{ radial }	

OPERATING PROGRAMS, time dist

Basic Nuclear Physics	%
Solid State Physics	%
Bio-Medical Applications	%
Isotope Production	%
Development	%
Machine research	100 %

PLAN VIEW OF FACILITY, NOTEWORTHY FEATURES, OPERATION SUMMARY, ADDITIONAL REFERENCES