ENG. DESIGN, date 1966–1972 CONSTRUCTION, date 1966–1973 FIRST BEAM date (or goal) March 1976 MAJOR ALTERATIONS OPERATION, 120 hr/wk; On Target 100 hr/wk TIME DIST., in house %, outside weeks COST, ACCELERATOR COST, FACILITY, total FUNDED BY ACCELERATOR STAFF, OPERATION and DEVELOPMENT SCIENTISTS ENGINEERS TECHNICIANS CRAFTS GRAD STUDENTS involved during year OPERATED BY Res staff or Operators BUDGET, op & dev FUNDED BY RESEARCH STAFF, not included above USERS, in house outside TUNED by GRAD STUDENTS involved during year SES. BUDGET, in house FUNDED BY FUNDED BY RESEARCH STAFF, not included above USERS, in house outside TUNED by FACILITIES FOR RESEARCH SHIELDED AREA, fixed 1000 m² RF PALS FUNDED BY FACILITIES FOR RESEARCH SHIELDED AREA, fixed 1200 m² RF PHAS RF POWER STATIONS SERVED at same time, max MAG SPECTROGRAPH, type COMPUTER, model OTHER FACILITIES OAP, min max AVERAG CURRENT NUMBER VECHAGO WEIGHT CONDUCT STABILITIES GAP, min max AVERAG CURRENT NUMBER POLE FAL WEIGHT: CONDUCT CONDUCT STORED COOLING WEIGHT CONDUCT STORED CONDUCT STORED COOLING WEIGHT CONDUCT STORED CONDUCT STORED COOLING WEIGHT CONDUCT STORED COOLING WEIGHT CONDUCT STORED CONDUCT STORED COOLING WEIGHT CONDUCT STORED COOLING WEIGHT CONDUCT STORED CONDU	diameter 240 cm; R extraction 103 cm 232 cm; Field 23.0 kG 32 cm; Field 11.2 kG
DESIGN, date 1965—70MODEL tests 1963—66 ENG. DESIGN, date 1966—1972 CONSTRUCTION, date 1966—1973 FIRST BEAM date (or goal) March 1976 MAJOR ALTERATIONS OPERATION, 120 hr/wk; On Target 100 hr/wk TIME DIST., in house %, outside % USERS' SCHEDULING CYCLE weeks COST, ACCELERATOR COST, ACCELERATOR COST, FACILITY, total FUNDED BY ACCELERATOR STAFF, OPERATION and DEVELOPMENT SCIENTISTS ENGINEERS TECHNICIANS CRAFTS GRAD STUDENTS involved during year DEFEATED BY Res staff or Operators BUDGET, op & dev FUNDED BY RESEARCH STAFF, not included above USERS, in house outside TUNED by RES. BUDGET, in house funding year SESS BUDGET, in house funding year SESS BUDGET, in house funding year FUNDED BY FACILITIES FOR RESEARCH SHIELDED AREA, fixed 1000 m² movable 1200 m² TARGET STATIONS 16 in 6 rooms STATIONS served at same time, max MAG SPECTROGRAPH, type COMPUTER, model DTHER FACILITIES OTHER FACILITIES OTHER FACILITIES OTHER FACILITIES OTHER FACILITIES OTHER FACILITIES VERNACE GAP, min max AVERAG GAP, min max AVERAG	diameter 240 cm; R extraction 103 cm 232 cm; Field 23.0 kG at 0.83 10 ⁶
ENG. DESIGN, date 1966–1972 CONSTRUCTION, date 1966–1973 FIRST BEAM date (or goal) March 1976 MAJOR ALTERATIONS CURREN' NUMBER OPERATION, 120 hr/wk; On Target 100 hr/wk TIME DIST., in house %, outside weeks COST, FACILITY, total FUNDED BY COPERATED BY Res staff or Operators BUDGET, op & dev FUNDED BY CUSERS, in house outside TUNED BY COST, SECRET SESEARCH COST, FACILITES FOR RESEARCH COST, SECRET SEST SECRET SESS SECRET SESS. BUDGET, in house outside SESS. BUDGET, in house TUNED BY FACILITIES FOR RESEARCH SHIELDED AREA, fixed 1000 m² RF PASS FACILITIES FOR RESEARCH SHIELDED AREA, fixed 1000 m² RF PHASS COMPUTER, model DTHER FACILITIES COMPUTER, model DTHER FACILITIES COMPUTER, model DTHER FACILITIES CONSTRUCT 1976 AVERAG CURREN' NUMBER AVERAG CURREN' NUMBER AVERAG CURREN' NUMBER POLE FACILITIES GAP, min, max AVERAG AVERAG CURREN' NUMBER FOLE FACILITIES GAP, min, max AVERAG AVERAG CURREN' Harmon Harmon FOLE FACILITIES GAP, min, max AVERAG AVERAG AVERAG AVERAG AVERAG AVERAG AVERAG FOLE FACILITIES GAP, min, max MACIONA AVERAG AVERAG FOLE FACILITIES AVERAG FOLE FACILITIES GAP, min, max AVERAG AVERAG FOLE FACILITIES AVERAG FOLE FACILITIES FOLE FACILITIES AVERAG FOLE FACILITIES AVERAG FOLE FACILITIES AVERAG FOLE FACILITIES AVERAG FOLE FACILITIES FOLE FACILITIES GAP, min, max AVERAG FOLE FACILITIES AVERAG FOLE FACILITIES AVERAG FOLE FACILITIES FOLE FACILITIES AVERAG FOLE FACILITIES AVERAG FOLE FACILITIES FOLE FACILITIES AVERAG FOLE FACILITIES FOLE FACILITIES AVERAG FOLE FACILITIES AVERAG FOLE FAC	diameter 240 cm; R extraction 103 cm 232 cm; Field 23.0 kG 332 cm; Field 11 2 kG at 0.83 106
TONSTRUCTION, date 1966–1973 TIRST BEAM date (or goal) March 1976 MAJOR ALTERATIONS CURREN' NUMBER OPERATION, 120 hr/wk; On Target 100 hr/wk TIME DIST., in house %, outside weeks COST, ACCELERATOR COST, FACILITY, total FUNDED BY ACCELERATOR STAFF, OPERATION and DEVELOPMENT SCIENTISTS ENGINEERS TECHNICIANS CRAFTS GRAD STUDENTS involved during year DPERATED BY Res staff or Operators BUDGET, op & dev FUNDED BY RESEARCH STAFF, not included above USERS, in house outside TUNED by GRAD STUDENTS involved during year DEES, nu BEAM AF TUNED b RESEARCH STAFF, not included above USERS, in house outside TUNED by FACILITIES FOR RESEARCH SHIELDED AREA, fixed 1000 m² movable 1200 m² FARGET STATIONS 16 in 6 rooms STABILITIES MAG SPECTROGRAPH, type COMPUTER, model DTHER FACILITIES CONSTRUCT 1976 MACCELER WEIGHT: CONDUCT STORED COOLING WEIGHT: CONDUCT STORED CONDUCT	cm; Field 23.0 kG at 0.83 10 ⁶
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MAJOR ALTERATIONS CURREN' NUMBER POLE FAR TIME DIST., in house	amnere turns
MAJOR ALTERATIONS CURREN' NUMBER POPERATION, 120 hr/wk; On Target 100 hr/wk POLE FAR TIME DIST., in house	FIELD at R ext 17.0 kG ampere turns
TIME DIST., in house	STABILITY 30 parts/10 ⁶ ; $B_{max}/\langle B \rangle 1 \cdot 35$ F SECTORS 3 ; SPIRAL, max 45 deg
USERS' SCHEDULING CYCLE Weeks COST, ACCELERATOR COST, ACCELERATOR COST, FACILITY, total FUNDED BY ACCELERATOR STAFF, OPERATION and DEVELOPMENT SCIENTISTS ENGINEERS TECHNICIANS CRAFTS GRAD STUDENTS involved during year DPERATED BY Res staff or DPERATED BY RESEARCH STAFF, not included above USERS, in house USERS, in house FUNDED BY ACCELER GRAD STUDENTS involved during year USERS, in house FUNDED BY RESEARCH STAFF, not included above USERS, budget, in house FUNDED BY FACILITIES FOR RESEARCH STABILIT SHIELDED AREA, fixed MOVABLE TARGET STATIONS 16 in 6 rooms Type FREQUET MAG SPECTROGRAPH, type COMPUTER, model DTHER FACILITIES VOKE/PO SECTO TONNENE	COIL PAIRS: AVF/sec;
COST, ACCELERATOR COST, FACILITY, total FUNDED BY ACCELERATOR STAFF, OPERATION and DEVELOPMENT SCIENTISTS TECHNICIANS CRAFTS GRAD STUDENTS involved during year OPERATED BY RESEARCH STAFF, not included above USERS, in house GRAD STUDENTS involved during year FUNDED BY RESEARCH STAFF, not included above USERS, in house GRAD STUDENTS involved during year RES. BUDGET, in house FUNDED BY RESEARCH STAFF, not included above USERS, in house GRAD STUDENTS involved during year RES. BUDGET, in house FUNDED BY FACILITIES FOR RESEARCH SHIELDED AREA, fixed TOND TOND TOND TOND TOND TOND TOND TOND	correction 3 per sector
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ACCELERATOR STAFF, OPERATION and DEVELOPMENT SCIENTISTS ENGINEERS TECHNICIANS CRAFTS SECTO OPERATED BY Res staff or Operators BUDGET, op & dev FUNDED BY ACCELER RESEARCH STAFF, not included above USERS, in house outside TUNED b GRAD STUDENTS involved during year FUNDED BY ACCELER RESEARCH STAFF, not included above USERS, in house outside TUNED b FACILITIES FOR RESEARCH SHIELDED AREA, fixed 1000 m² m² m² RF PHAS movable 1200 m² m² RF PHAS STAFIONS served at same time, max MAG SPECTROGRAPH, type COMPUTER, model OTHER FACILITIES TARGET STATIONS MEAN MODULE BEAM VACUUM	tons; Coils 83.5 Cu tons
ACCELERATOR STAFF, OPERATION and DEVELOPMENT SCIENTISTS ENGINEERS TECHNICIANS CRAFTS GRAD STUDENTS involved during year OPERATED BY Res staff or Operators BUDGET, op & dev FUNDED BY RESEARCH STAFF, not included above USERS, in house outside GRAD STUDENTS involved during year TUNED b GRAD STUDENTS involved during year RES. BUDGET, in house orbital orbital state of the state of t	DR, Material and type <u>Cupruous</u>
ACCELERATOR STAFF, OPERATION and DEVELOPMENT SCIENTISTS	NERGYMJ
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SCIENTISTS ENGINEERS TECHNICIANS CRAFTS SECTO GRAD STUDENTS involved during year OPERATED BY Res staff or OPERATED BY RESEARCH STAFF, not included above BEAM AFTUNED BY BEAM AFTUNED BY BEAM AFTUNED BEAM AFTUNED BY BEAM AFTUNED BEAM AFTUNED BY BEAM BY BEAM BY BEAM BY BEAM BY BY BEAM	in coils 200 max, kW
TECHNICIANS CRAFTS SECTOR GRAD STUDENTS involved during year ION ENER DEER ACCELER BUDGET, op & dev FUNDED BY ACCELER BEAM AFF, not included above BEAM AFF TUNED by BEAM AFF	mming coils OUU max, kW
GRAD STUDENTS involved during year OPERATED BY Res staff or OPERATED BY Res staff or OPERATED BY RESEARCH STAFF, not included above BEAM AFTUNED by BEAM AFTUN	E AREA%
ACCELER BUDGET, op & dev FUNDED BY RESEARCH STAFF, not included above USERS, in house outside TUNED b RES. BUDGET, in house Orb F_2 FUNDED BY FACILITIES FOR RESEARCH SHIELDED AREA, fixed 1200 m^2 movable 1200 m^2 FARGET STATIONS 16 rooms STATIONS served at same time, max MAG SPECTROGRAPH, type MODU. DTHER FACILITIES WACUUM	ANGLE (Sep Sec) deg $(Y + Q^2/A^2)$ MeV
RESEARCH STAFF, not included above BESEARCH STAFF, not included above BESEARCH STAFF, not included above BEAM AF USERS, in house	iY (Bending limit) $E/A = 140$ q^2/A^2 MeV
RESEARCH STAFF, not included above USERS, in house	(Focusing limit) E/A = 100 q/A MeV
RESEARCH STAFF, not included above USERS, in house	TION SYSTEM
GRAD STUDENTS involved during year RES. BUDGET, in house FUNDED BY FACILITIES FOR RESEARCH SHIELDED AREA, fixed movable TARGET STATIONS STATIONS 16 in 6 rooms STATIONS served at same time, max MAG SPECTROGRAPH, type COMPUTER, model OTHER FACILITIES TUNED b RF 7. HARMON DEE-Gnd, STABILIT RF PHAS RF POWE RF PROT Type FREQUEI MODU BEAM VACUUM	
GRAD STUDENTS involved during year RES. BUDGET, in house FUNDED BY FACILITIES FOR RESEARCH SHIELDED AREA, fixed movable TARGET STATIONS STATIONS 16 in 6 rooms STATIONS served at same time, max MAG SPECTROGRAPH, type COMPUTER, model DTHER FACILITIES TUNED b RF 7. HARMON DEE-Gnd, STABILIT RF PHAS RF POWE RF PROT Type FREQUEI MODU BEAM VACUUM	per1angle180deg
GRAD STUDENTS involved during year RES. BUDGET, in house FUNDED BY FACILITIES FOR RESEARCH SHIELDED AREA, fixed movable TARGET STATIONS STATIONS 16 in 6 rooms STATIONS served at same time, max MAG SPECTROGRAPH, type COMPUTER, model DTHER FACILITIES TUNED b RF 7. HARMON DEE-Gnd, STABILIT RF PHAS RF POWE RF PROT Type FREQUEI MODU BEAM VACUUM	RTURE 5 cm; DC BIAS 0 kV
FES. BUDGET, in house FUNDED BY HARMON DEE-Gnd, STABILIT SHIELDED AREA, fixed movable TARGET STATIONS STATIONS 16 in 6 rooms STATIONS served at same time, max MAG SPECTROGRAPH, type COMPUTER, model DTHER FACILITIES Orb F_2 HARMON DEE-Gnd, STABILIT RF PHAS RF POWE RF PROT Type FREQUEI MODU BEAM VACUUM	coarse MS fine VC auto to 22.5 mHz, stable ± 0.01 /10 ⁶
FUNDED BY HARMON DEE-Gnd, STABILIT SHIELDED AREA, fixed movable TARGET STATIONS STATIONS TATIONS served at same time, max MAG SPECTROGRAPH, type COMPUTER, model DTHER FACILITIES HARMON DEE-Gnd, STABILIT RF PHAS RF POWE RF PROT Type FREQUEI MODU BEAM VACUUM	
FACILITIES FOR RESEARCH SHIELDED AREA, fixed 1000 m ² RF PHAS RF POWE RF PROT TARGET STATIONS 16 in 6 rooms STATIONS served at same time, max MAG SPECTROGRAPH, type FREQUEI MODL BEAM VACUUM	5to22_5 mHz; GAIN, max250_kV/turn
FACILITIES FOR RESEARCH SHIELDED AREA, fixed 1000 m ² movable 1200 m ² RF PHAS RF POWE RF PROT TARGET STATIONS 16 in 6 rooms STATIONS served at same time, max MAG SPECTROGRAPH, type FREQUEI COMPUTER, model BEAM OTHER FACILITIES	S, RF/Orb F, used 1, 3
SHIELDED AREA, fixed 1000 m ² RF PHAS RF POWE RF PROT TARGET STATIONS 16 in 6 rooms STATIONS served at same time, max MAG SPECTROGRAPH, type MODULER, model DTHER FACILITIES VACUUM	nax <u>125</u> kV, min gap <u>5</u> cm
TARGET STATIONS 16 in 6 rooms STATIONS served at same time, max MAG SPECTROGRAPH, type MODU COMPUTER, model DITHER FACILITIES VACUUM	, (pk-pk noise)/(pk RF volt)
TARGET STATIONS 16 in 6 rooms STATIONS served at same time, max FREQUEI MAG SPECTROGRAPH, type MODU COMPUTER, model BEAM OTHER FACILITIES VACUUM	stable to \pm deg input, max 450kW
TARGET STATIONS 16 in 6 rooms Type_ STATIONS served at same time, max FREQUEI MAG SPECTROGRAPH, type MODU COMPUTER, model BEAM OTHER FACILITIES VACUUM	
TYPE_ TATIONS served at same time, maxFREQUEI MAG SPECTROGRAPH, typeMODL COMPUTER, modelBEAM DTHER FACILITIESVACUUM	CT circuit, speed µsec
MAG SPECTROGRAPH, type	NA MODUL A TION
COMPUTER, model MODE DTHER FACILITIES BEAM VACUUM	CY MODULATION, rate/sec
OTHER FACILITIES VACUUM	ATOR, type
	ULSE, width
PUMPS N	YSTEM
	Type, Size 3 Diffusion pumps
	(50 cm)
OPERATI	3 PRESSURE 5
REFERENCES/NOTES	G PRESSURE $\frac{5}{2}$ μ Torr,
Proceedings of Intermetion	i Hiviehrs
Proceedings of Internation ION SOUR	ES/INJECTION SYSTEM
Syclotron Conference, Vacouver, Canada, 87(1972).	

ENTRY NO. 95 (cont.)

CHARACTERIS"	TIC BEAMS			BEAM PROPERTIES		
CHARACTERIS	TIC BEAWS	0 1		Measured	Conditions	
		Goal	Achieved			
	Particle	(MeV)	(MeV)	Pulse Width 15 RF deg_		
ENERGY [*]	P	100	72	Phase Exc, maxRF deg _	μA of MeV	
	D.	70	64	Extract Eff 60 %	5 μA of 50 MeV	
		140	128	Res, ΔΕ/Ε 0.3_%	5_ μA of _50_ MeV _	
				Emittance		
CURRENT Internal	P	100	100	$(mm-mrad)$ $\left\{ \begin{array}{c} 10 \\ 12 \end{array} \right\}$ radial	2 μA of 50 MeV	-
	*	-		OPERATING PROGRAMS, time dist		
External	P	50	10	Basic Nuclear Physics	100	%
		-		Solid State Physics		%
				Bio-Medical Applications		%
Secondary			Isotope Production		%	
		(part/s)	(part/s)	Development		%
	***************************************		Technological Control of the Control			%
	Was Carried Williams State Const.					%

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

- 1. The valley coil will operate at $E_{\rm p} > 80~{\rm MeV}$.
- 2. The cyclotron is intended to be as a pulsed neutron generator.
- 3. It is supposed to accelerate heavy ions (up to Xe) after the pre-acceleration in the tandem-generator.
- 4. The source of polarized and deutrons will be desingned and installed.

