ENTRY NO. CB2 Date July 1/1992

Name of Machine TARN II

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In Charge: Reported by: T.Katayama

HISTORY

MILESTONE DATES:

Design 1984-1985 Model Tests

Construction 1985-1989 First Beam 1989

DESIGN/CONSTRUCTION BY:

in house other

COST: Accelerator 13M$(Total) Facility

FUNDED BY: MINISTRY OF Education, Science and Culture

STATUS

STAFF: Machine

Scientists 5 Engineers 5

Technicians Students 1

Research (in house/external)

Scientists / Engineers /

Technicians / Students /

BUDGET: Machine ~1 M$/year Funded by Ministry of Education

Research Funded by

TIME DISTRIBUTION:

Basic Research (in house/external) % /

Applied Program (in house/external) % /

Maintenance % Development %

MAIN PARAMETERS

MACHINE TYPE: Cooler Synchrotron

ION TYPES: Light Ions ENERGY: 370(q/A=0.5), 1100(p MeV/u

RING: Geometry circular, 6 fold sym Circumference 78 m

INJECTED BEAM CHARACTERISTICS

PARAMETERS: Injected Ions P, d, α, H_2^+, ^3He, N, C, etc.

Energy 5~20 MeV/u Ions/bunch

EMITTANCE: h 15 πmm mrad v 15 πmm mrad

ΔE/E 0.1 % Bunch length nsec

TIMING: Bunch freq MHz Filling Time sec

INJECTION METHOD: Multi-turn Injection Cooling Stacking

MAGNET SYSTEM

LATTICE: Focusing Type Separated function

Focusing Order FBBDBBFO

Betatron Freq: ν_h 1.706 ν_v 1.725

No. Short Straight Sections 6 Length 4 m

No. Long Straight Sections Length m

BENDING MAGNETS: No. 24 Length(ea) 1.0 m

Field: max 1.5 T

QUADRUPOLES: No. 18 Length(ea) 0.2 m

Gradient: max 7.0 T/m

OTHER MAGNETS: Sextupole Magnet for slow Extraction

RF SYSTEM

CAVITIES: No. 1 Type 2xλ/4 re-entrant

RF FREQ. 0.62~7.50 MHz HARMONIC f_{rf}/f_{ion} ?

VOLTS/CAV(max) 0.002 MV

POWER/CAV(max) 0.005 MW

VACUUM SYSTEM

VACUUM CHAMBER: Material Stainless steel

Aperture 5 x 20 cm²

PUMPS:(No.,Type,Speed) TGP:26(1500ℓ/sx8, 1000ℓ/sx3, 700ℓ/sx4 400ℓ/sx11), SIP:17(800ℓ/sx6, 400ℓ/sx5, 160ℓ/sx6).

PRESSURE: 5x10⁻¹¹ Torr

EXTRACTION SYSTEM

TYPE: (a) Slow Extraction (1/3 resonance)

(b)

(c)

LENGTH OF SPILL: (a) 1~800 sec

(b) sec

(c) sec

CHARACTERISTIC BEAMS

	Ion	E/A (MeV/u)	Ions/pulse	ΔE/E (%)
(a)	α	220	10^7	0.5
(b)				
(c)				
(d)				

EXTRACTED BEAM PROPERTIES:

Rep. Rate (pulse/sec)

$\epsilon_n = \beta\gamma\epsilon$ h .... πmm mrad for .... μA of .... MeV/u .... ions

v .... πmm mrad for .... μA of .... MeV/u .... ions

FACILITIES FOR RESEARCH

SHIELDED AREA: Fixed 650 m² Moveable m²

Target Stations: No. Served At Same Time:

MAGNETIC SPECTROMETERS:

OTHER FACILITIES:

Electron Cooler, 120 kV, 5A

REFERENCES/NOTES

(a) T.Katayama et al., Particle Acc. Vols. 37~37 (1992)

(b) T.Tanabe et al., N.I.M., A307 (1991)

OTHER RELEVANT PARAMETERS, RECENT IMPROVEMENTS, ETC.

PLAN VIEW OF FACILITY, COMMENTS