

ENTRY NO. CU45 Date June 17, 1992  
 Name of Machine Mini cyclotron Model-325 (Sumitomo Heavy Industry)  
 Institution Kyoto University Hospital  
 Address 54, Shogoin-Kawahara-cho, Sakyo-ku, Kyoto 606, JAPAN  
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 In Charge: Junji Konishi, MD Reported by: Yasuhiro Magata, Ph.D.

**HISTORY**

MILESTONE DATES:  
 Design Model Tests  
 Construction 1982 First Beam Aug 1982  
 DESIGN/CONSTRUCTION BY:  
 in house other Sumitomo-CGR MeV  
 COST: Accelerator Facility  
 FUNDED BY: Ministry of Education, Japan

**STATUS**

STAFF: Machine  
 Scientists Engineers  
 Technicians 1 Students  
 Research (in house/external)  
 Scientists / Engineers /  
 Technicians / Students /  
 BUDGET: Machine \$200,000 Funded by Japan Ministry of  
 Research \$35,000 Funded by Education, etc.  
 TIME DISTRIBUTION:  
 Basic Research (in house/external) 20 % / %  
 Applied Program (in house/external) 70 % / %  
 Development % Maintenance 10 %

**MAGNET**

POLE PARAMETERS:  
 Diameter 81 cm R<sub>extract</sub> 32.5 cm R<sub>inject</sub> cm  
 HILL PARAMETERS: Gap (min) 7 cm B<sub>max</sub> T  
 (0 AT) Gap (max) cm B<sub>min</sub> T  
 VALLEY PARAMETERS: Gap (min) 12 cm B<sub>max</sub> T  
 (0 AT) Gap (max) cm B<sub>min</sub> T  
 AVERAGE FIELD: < B ><sub>min</sub> 76 T < B ><sub>max</sub> T  
 NUMBER OF SECTORS: compact/separated 4 /  
 sector angle deg. spiral (max) deg.  
 FIELD TRIMMING: Trim Coils 4 pairs  
 Harmonic Coils  
 Other  
 CURRENT: Main Coils 12.4 A Amps Stability  
 Trim Coils Amps Stability  
 Stored Energy (cryogenic) MJ  
 WEIGHT: Iron 13 tons Conductor 1.5 tons  
 ION ENERGY: Bending Limit E/A = q<sup>2</sup>/A<sup>2</sup> MeV/u  
 Focussing Limit E/A = q/A MeV/u

**ACCELERATION SYSTEM**

FUNDAMENTAL ACCELERATION:  
 Description: AVE  
 No. of Gaps/turn dE/dn(max) MeV/q  
 Voltage(max) 27.3 kV Harmonic f<sub>rf</sub>/f<sub>ion</sub>  
 Freq. 26.4 MHz Power in(max) MW  
 Stability: Phase Voltage  
 OTHER CAVITIES (Flattopping or otherwise):  
 Description:  
 Region of Influence: R<sub>min</sub> cm R<sub>max</sub> cm  
 No. of Gaps/turn dE/dn(max) MeV/q  
 Voltage(max) MV Harmonic f<sub>rf</sub>/f<sub>ion</sub>  
 Freq. MHz Power in(max) MW  
 Stability: Phase Voltage

**VACUUM SYSTEM**

OPERATING PRESSURE: 2 x 10<sup>-5</sup> torr  
 PUMPS: No. and type  
 1, diffusion pump 1300 l/sec

**ION SOURCE(S)**

Type	Intensity (mA)	ε = βγϵ (πmm mrad)	Ion Species
(a) Livingstone-Jones			H <sub>2</sub> <sup>+</sup> , D <sub>2</sub> <sup>+</sup>
(b)			
(c)			
(d)			

**INJECTION SYSTEM**

Efficiency %

**EXTRACTION SYSTEM**

Efficiency %

**CHARACTERISTIC BEAMS**

Accelerated Ions	E/A (MeV/u)	Current(part μA)	
		Internal	External
(a) p	15 MeV		50
(b) d	8 MeV		50
(c)			
(d)			

Secondary Particles	E (MeV)	part/sec
(a)		
(b)		
(c)		

**EXTRACTED BEAM PROPERTIES:**

For μA of MeV/u ions  
 ΔE/E % Δφ °rf  
 ε<sub>n</sub> = βγϵ x πmm mrad z πmm mrad

**FACILITIES FOR RESEARCH**

SHIELDED AREA: Fixed 110 m<sup>2</sup> Moveable 1 m<sup>2</sup>  
 Target Stations: No. Served At Same Time:  
 MAGNETIC SPECTROMETERS:  
 OTHER FACILITIES:

**REFERENCES/NOTES**

(a)  
 (b)

**PLAN VIEW OF FACILITY, COMMENTS**