

ENTRY NO. FM2 Date October 9, 1995
 Name of Machine Göttingen Synchrocyclotron
 Institution University of Göttingen, II. Physikalisches Institut
 Address Bunsenstr. 7-9, D-37073 Göttingen, GERMANY
 Tel 0049-(0)551-397631 Telex Fax 0049-(0)551-394493 E-MAIL SCHMIDT OTT@UP2U01.
 In Charge: Prof. Schmidt-Ott Reported by: DNET.GWDG.DE

HISTORY

MILESTONE DATES:
 Design 1958 Model Tests
 Construction 1960 First Beam 1962
 DESIGN/CONSTRUCTION BY:
 in house other Philips, Eindhoven
 COST: Accelerator 4.2x10⁶ DM Facility 5.9x10⁶ DM
 FUNDED BY: F.R. Germany / Lower Saxony

STATUS

STAFF: Machine
 Scientists 1 Engineers 1
 Technicians 2 Students
 Research (in house/external)
 Scientists 3 / Engineers /
 Technicians / Students 3 /
 BUDGET: Machine Funded by Lower Saxony
 Research Funded by Lower Saxony
 TIME DISTRIBUTION:
 Basic Research (in house/external) 20 % / 10 %
 Applied Program (in house/external) % / %
 Maintenance 20 % Development %

MAGNET

POLE PARAMETERS:
 Diameter 180 cm R_{extract} 75 cm R_{inject} 0 cm
 HILL PARAMETERS: Gap (min) 35 cm B_{max} 1.45 T
 (@ AT) Gap (max) cm B_{min} 1.42 T
 VALLEY PARAMETERS: Gap (min) cm B_{max} T
 (@ AT) Gap (max) cm B_{min} T
 AVERAGE FIELD: _{min} T _{max} T
 NUMBER OF SECTORS: compact/separated /
 sector angle deg. spiral (max) deg.
 FIELD TRIMMING: Trim Coils
 Harmonic Coils
 Other 500 3x10⁻⁴
 CURRENT: Main Coils 500 Amps Stability 3x10⁻⁴
 Trim Coils Amps Stability 0.5
 Stored Energy (cryogenic) MJ
 WEIGHT: Iron 250 kg Conductor al. 2 kg
 ION ENERGY: Bending Limit E/A = 13.9 q²/A² MeV/u
 Focusing Limit E/A = q/A MeV/u

ACCELERATION SYSTEM

FUNDAMENTAL ACCELERATION:
 Description: Dee + Dummy Dee, 7cm gap, freq. modulation
 No. of Gaps/turn 2 dE/dn(max) MeV/q
 Voltage (max) 6.25 MV Harmonic f_{rf}/f_{ion} 1
 Freq 10.6-11.1 MHz Power in(max) 0.018 MW
 Stability: Phase Voltage
 OTHER CAVITIES (Flattopping or otherwise):
 Description:
 Region of Influence: R_{min} cm R_{max} cm
 No. of Gaps/turn dE/dn(max) MeV/q
 Voltage (max) MV Harmonic f_{rf}/f_{ion}
 Freq MHz Power in(max) MW
 Stability: Phase Voltage

VACUUM SYSTEM

OPERATING PRESSURE: 10⁻⁶ mbar
 PUMPS: (No. and type) 6000 l/s + 1000 l/s diffusion

ION SOURCE(S)

Type	Intensity (mA)	@ ε _n = βγε (π mm mrad)	Ion Species
(a) gas discharge			α, d
(b)			
(c)			
(d)			

INJECTION SYSTEM

Efficiency %

EXTRACTION SYSTEM

magn. channel (Le Couteur) Efficiency 5 %

CHARACTERISTIC BEAMS

Accelerated Ions	E/A (MeV/u)	Current (part μA)	
		Internal	External
(a) α	13.5	0.3	
(b) d	13.5	8	0.4
(c)			
(d)			

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

EXTRACTED BEAM PROPERTIES:

For 0.4 μA of 13.5 MeV/u d ions
 ΔE/E < 0.1 % Δφ
 ε_n = βγε x 100 π mm mrad z 100 π mm mrad

FACILITIES FOR RESEARCH

SHIELDED AREA: Fixed: 160 m² Moveable m²
 Target Stations: No. Served At Same Time:
 MAGNETIC SPECTROMETERS:
 OTHER FACILITIES: gas transport
 cooled internal target

REFERENCES/NOTES

(a) Philips Techn. Rev. Vol. 12, No. 3
 (b) CERN Report 63-19, 80

PLAN VIEW OF FACILITY, COMMENTS