

ENTRY NO: C-13
Machine Name: ISL Berlin (the former VICKSI)
Date: 9/3/01 11:24:33 AM
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HISTORY

Designed By: in house, Scanditronix, Danfysik, and others
Construction Dates: cyclotron design 1973-74, construction 1974-76

First Beam Date: June 1977

CHARACTERISTIC BEAMS

ions	/ energy(MeV/N)	/current(pps)	/power(w)
P	68	2x10exp11	2
12C	3.6	2x10exp12	86
86Kr	6.4	3x10exp09	5
129Xe	1.8	8x10exp10	70
129Xe	3.5	1x10exp11	135

transmission efficiency(source to extract beam)

typical: 10% - **best:** 30%

transverse emittance

emittance definition: normalized

vertical: 5π mm mrad

horizontal: 6π mm mrad

longitudinal: 0.1 x 6(Δ) E/E)%xdeg RF

USES

basic research: 38%

therapy: 18%

development: 12%

isotope production: -%

other: 14%

maintenance: 5%

beam tuning: 13%

Total Time: 5000h/year

TECHNICAL DATA

a)magnet: type: seperated sectors

Kb: 132MeV/A **Kf:** MeV/A

average field (min/max): 0.89 max. T

number of magnet sectors: 4

hill angular width: 50hill angular width

spiral (max): - deg

pole parameters

diameter: - m

injection radius: 0.43 m

extraction radius: 1.71 m

hill gap: 0.06m **valley gap:** openm

trim coils

-number: 9x2

-current(max): 100A A-turns

harmonic coils

-number: 3xNsectorsx2

-current(max): 150A A-turns

main coils

number: 1x2

total ampere-turns: 2000x30 A-turns

current: 2000 A

stored energy: MJ

weight - iron: 360t coils: 6t

power

main coils (total): 400 kW

trim coils (total max): 60 kW

refrigerator (cryogenic): - kW

b)RF

acceleration

frequency range: 10 - 20MHz

harmonic modes: 2 - 8

number of dees: 2

number of cavities: 2

dee angular width: 36degrees

voltage

at injection: 140kV(peak to ground, max)

at extraction: 100 min.kV(peak to ground, max)

peak: 140kV(peak to ground, max)

line power(max): 200kW

stability

phase: <0.1 deg

voltage: <0.05%

injection

c)ion source: 2 of ECR-type

external injection: radial

components: 2 magnetic, 1 electrostatic

source bias voltage: 15, + add. accelerationkV

injection energy: 0.09 - 4MeV/N

buncher: yes; 60% within 6 degrees

injection efficiency: 70%

d)injector: either 6MV Van-de-Graaf, or 2-stage-RFQ

e)extraction

3 radial deflectors; 2 magnetic, 1 electrostatic

efficiency

typical: 95%

best: 100%

f)vacuum

pumps: 2 cryopumps, 2 turbopumps

achieved vacuum: 1x10exp-5Pa

REFERENCES

IEEE Vol.NS-26/2, 1979, p.1872, 2300, 2209, 2355, 2202 Proc.

5th EPAC, 1996, 759, ISBN 0 7503 0384 0

EXPERIMENTAL FACILITIES

External pulsing gives 1ns beam pulses with 100ns repetition down to one shot operation. 18 target areas, among these 3 low energy beam lines at the Van-de-Graaff injector, a cave for medical applications, a dual beamline to bombard samples with low and high energy beams simultaneously, and a Q3D spectrometer.

ECAART 5, 1997, Nucl.Inst.&Meth. B 139 (1998) 58-64

COMMENTS

