ENTRY NO: C-7
Machine Name: K130 cyclotron
Date: 5/22/01 8:41:10 AM
Institution: University of Jyvskyl, Department of Physics (JYFL)
Address P.O. Box 35, FIN-40351 Jyvskyl, Finland
In Charge of Cyclotron: E. Liukkonen
Telephone: +358-14-260 2400
Fax: +358-14-260 2401
Person Reporting: P. Heikkinen
Web: http://www.phys.jyu.fi
E-mail: Pauli.Heikkinen@phys.jyu.fi

HISTORY
Designed By: Scanditronix AB, JYFL
Construction Dates: 1988-1990, Negative ions: 2000
First Beam Date: 1992
CHARACTERISTIC BEAMS

ions	/ **energy**(MeV/N)/**curre**nt(pps)/**powe**r(w)		
proton	45	6.2e14	4500
Ar	5	2.7e13	870
Ni	4.7	2.8e12	124
Kr	9.4	2.2e12	285

transmision efficiency(source to extract beam)
typical: 5-10% - **best:** 15%
tranverse emmitance
emmitance definition: rms
vertical: $<10\pi$ mm mrad
horizontal: $<10\pi$ mm mrad
longitudinal: (Δ) E/E)%xdeg RF

USES
basic research: 78% **therapy:** %
development: 3% **isotope production:** 8%
other: 8% **maintenance:** 2%
beam tuning: 1% **Total Time:** 6500h/year

TECHNICAL DATA
a)magnet: **type:** compact
Kb: 130MeV/A **Kf:** 90MeV/A
average field (min/max): 1.77(1.3-2.1) T
number of magnet sectors: 3
hill angular width: variable (51-58)hill angular width
spiral (max): 58 deg
pole parameters
diameter: 2.40 m
injection radius: 0.0131-0.0188 m
extraction radius: 0.94 m
hill gap: 0.174m **valley gap:** 0.330m
trim coils
-number: 15x2
-current(max): 70-100 A-turns
harmonic coils
-number: 4xNsectorsx2
-current(max): 5 A-turns
main coils
number: 1x2
total ampere-turns: 400000 A-turns
current: 1000 A
stored energy: MJ
weight - iron: 308t coils: 15t
power
main coils (total): 130 kW
trim coils (total max): 22.5 kW
refrigerator (cryogenic): kW
b)RF
acceleration
frequency range: 10-21MHz
harmonic modes: 1, 2, 3
number of dees: 2
number of cavities:
dee angular width: 78degrees
voltage
at injection: kV(peak to ground, max)
at extraction: kV(peak to ground, max)
peak: 50kV(peak to ground, max)
line power(max): 100kW
stability
phase: deg
voltage: %
injection
c)ion source: Multicusp(neg), 6.4 GHz ECR, 14 GHz ECR
external injection: axial
components: dipoles, solenoids, quadrupoles, buncher, choppper, spiral inflector
source bias voltage: 0-20kV
injection energy: MeV/N
buncher: Single gap, 1st and 2nd harm
injection efficiency: 30-70%
d)injector:
e)extraction
-electrostatic deflector, 50 kV -electromagnetic channel, 1250 A -passive channels, (hor. + vert. focusing) -stripper for negative ions
efficiency
typical: 70%
best: 90 (100/st%
f)vacuum
pumps: 2 cryo pumps 5000 l/s (for N)
achieved vacuum: 5e-6Pa
REFERENCES

EXPERIMENTAL FACILITIES
Isotope separator on line IGISOL, gas filled recoil separator RITU, gamma detector arrays, high efficiency neutron detector system HENDES, 1.5 m diam. scattering chamber, chamber for radiation defects studies, superconducting electron spectrometer
COMMENTS