

**ENTRY NO:** C-12  
**Machine Name:** CIME/SPIRAL  
**Date:** 6/8/01 12:06:45 PM  
**Institution:** GANIL  
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## HISTORY

**Designed By:** GANIL  
**Construction Dates:** 1994-1998  
**First Beam Date:** april 1998-(RIB) july 2001  
**CHARACTERISTIC BEAMS**

ions	/ energy(MeV/N)/current(pps)/power(w)
RIB	1,7-25 <5.10**11

## transmission efficiency(source to extract beam)

typical: 45% - best: 57%

## tranverse emittance

**emittance definition:** maginal

vertical: 20-30 $\pi$  mm mrad

horizontal: 10 $\pi$  mm mrad

longitudinal: 0.15\*10 (RMS)( $\Delta$ ) E/E)%xdeg RF

## USES

basic research: %	therapy: %
development: 100%	isotope production: %
other: %	maintenance: %
beam tuning: %	Total Time: h/year

## TECHNICAL DATA

a)magnet: type: compact

Kb: 265MeV/A Kf: MeV/A

average field (min/max): 1.56/0.75 T

number of magnet sectors: 4

hill angular width: 44hill angular width

spiral (max): none deg

pole parameters

diameter: 3.5 m

injection radius: .034/.045 m

extraction radius: 1.5 m

hill gap: 0.12m valley gap: 0.3m

trim coils

-number: 11x2

-current(max): 800 A-turns

harmonic coils

-number: 1xNsectorsx2

-current(max): 200 A-turns

main coils

number: 1x2

total ampere-turns: 272000 A-turns

current: 800 A

stored energy: MJ

weight - iron: 550t coils: 4.5t

power

main coils (total): 100 kW

trim coils (total max): 40 kW

refrigerator (cryogenic): kW

b)RF

acceleration

frequency range: 9.6-14.5MHz

harmonic modes: 2-3-4-5

number of dees: 2

number of cavities: 2

dee angular width: 40degrees

voltage

at injection: 100kV(peak to ground, max)

at extraction: 95kV(peak to ground, max)

peak: 100kV(peak to ground, max)

line power(max): 42\*2kW

stability

phase: 0.1 deg

voltage: 0.02%

injection

c)ion source: ECR

external injection: axial

components: Muller (Ri=0.034m)/ spiral(Ri=0.045m)

inflector

source bias voltage: 34kV

injection energy: MeV/N

buncher: saw tooth type

injection efficiency: 65%

d)injector:

e)extraction

2 electrostatic deflectors 17 deg. 80 KV/cm 2 magnetostatic

channels 16 deg. CM1=5.2T/m; CM2=12.9T/m

efficiency

typical: 65%

best: 85%

f)vacuum

pumps: 1 cryogenic panel, 2 turbomolecular

achieved vacuum: 5.10-6Pa

## REFERENCES

M.Lieuvin et al."Commissioning of SPIRAL, the GANIL radioactive beam facility" Int. conf. on Cyclotrons and their Applications, East Lansing, USA, may 2001 F.Varenne and al."SPIRAL facility: Beam dynamics and experimental tests with stable ions" Int. conf. on Cyclotrons and their Applications, East Lansing,USA,may 2001 D.Bibet and the SPIRAL group,"Production and post acceleration scheme for SPIRAL" Int. Workshop on Production of radioactive Ions Beams, Puri India, Feb. 2001

## EXPERIMENTAL FACILITIES

9 experiment rooms of the GANIL facility

## COMMENTS