**ENTRY NO:** C13
**Date:** 07 Feb 2005 11:59:30
**Machine Name:** CIME/SPIRAL
**Institution:** GANIL
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**Person in Charge of Cyclotron:** Eric Petit
**Person Reporting Information:** A. Savalle
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**History**
**Designed by:** GANIL
**Construction Dates:** 1994-1998
**First Beam Date:** april 1998-(RIB) july 2001
**Characteristic Beams**
RIB 1,7-25 (MeV/n) <5.10**11 (pps)
**Transmission Efficiency (source to extracted beam)**
**Typical (%):** 45
**Best (%):** 57
**Emittance**
**Emittance Definition:** maginal
**Vertical (pi mm mrad):** 20-30
**Horizontal (pi mm mrad):** 10
**Longitudinal (dE/E[%] x RF[deg.]):** 0.15*10 (RMS)
**USES**
**Basic Research (%):**
**Development (%):** 100
**Therapy (%):**
**Isotope Production (%):**
**Other Application (%):**
**Maintenance (%):**
**Beam Tuning (%):**
**Total Time (h/year):**

**TECHNICAL DATA**
**(a)Magnet**
**Type:** compact
**Kb (MeV):** 265
**Kf (MeV):**
**Average Field (min./max. T):** 1.56/0.75
**Number of Sectors:** 4
**Hill Angular Width (deg.):** 44
**Spiral (deg.):** none
**Pole Diameter (m):** 3.5
**Injection Radius (m):** .034/.045
**Extraction Radius (m):** 1.5
**Hill Gap (m):** 0.12
**Valley Gap (m):** 0.3
**Trim Coils**
**Number:** 11x2
**Maximum Current (A-turns):** 800
**Harmonic Coils**
**Number:** 1xNsectorsx2
**Maximum Current (A-turns):** 200
**Main Coils**
**Number:** 1x2
**Total Ampere Turns:** 272000
**Maximum Current (A):** 800
**Stored Energy (MJ):**
**Total Iron Weight (tons):** 550
**Total Coil Weight (tons):** 4.5
**Power**
**Main Coils (total KW):** 100
**Trim Coils (total, maximum, KW):** 40
**Refrigerator (cryogenic, KW):**

**(b)RF**
**Acceleration**
**Frequency Range (MHz):** 9.6-14.5
**Harmonic Modes:** 2-3-4-5
**Number of Dees:** 2
**Number of Cavities:** 2
**Dee Angular Width (deg.):**40
**Voltage**
**At Injection (peak to ground, KV):** 100
**At Extraction (peak to ground, KV):** 95
**Peak (peak to ground, KV):** 100
**Line Power (max, KW):** 42*2
**Phase Stability (deg.):** 0.1
**Voltage Stability (%):** 0.02

**(c)Injection**
**Ion Source:** ECR
**Source Bias Voltage (kV):** 34
**External Injection:** axial
**Buncher Type:** saw tooth type
**Injection Energy (MeV/n):**
**Component:** Muller (Ri=0.034m)/ spiral(Ri=0.045m) inflector
**Injection Efficiency (%):** 65
**Injector:**

**(d)Extraction**
**Elements, Characteristic:**
2 electrostatic deflectors 17 deg. 80 KV/cm
2 magnetostatic channels 16 deg. CM1 = 5.2T/m; CM2 = 12.9T/m
**Typical Efficiency (%):** 65
**Best Efficiency (%):** 85

**(e)Vacuum**
**Pumps:** 1 cryogenic panel, 2 turbomolecular
**Achieved Vacuum (Pa):** 5.10-6

**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**