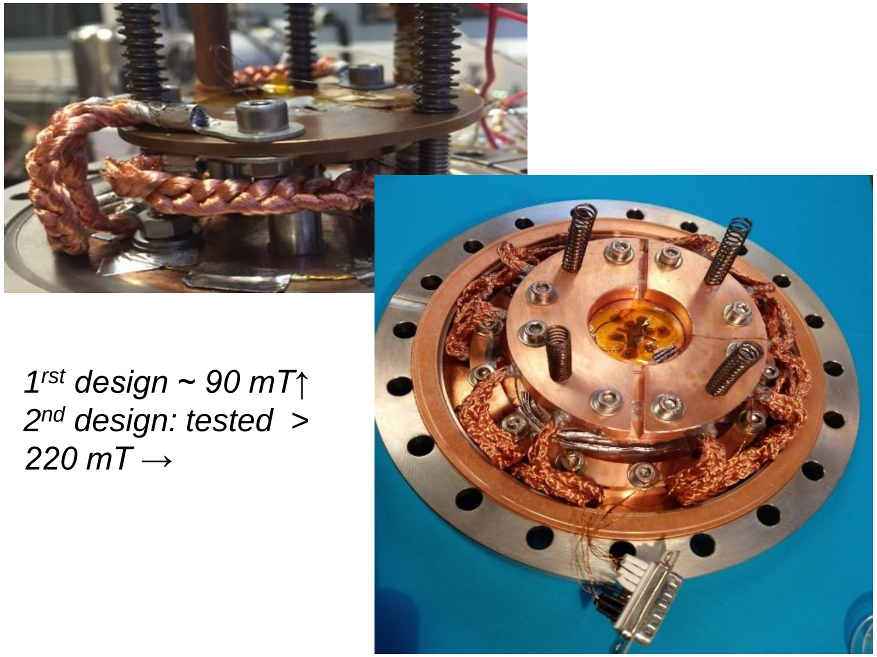
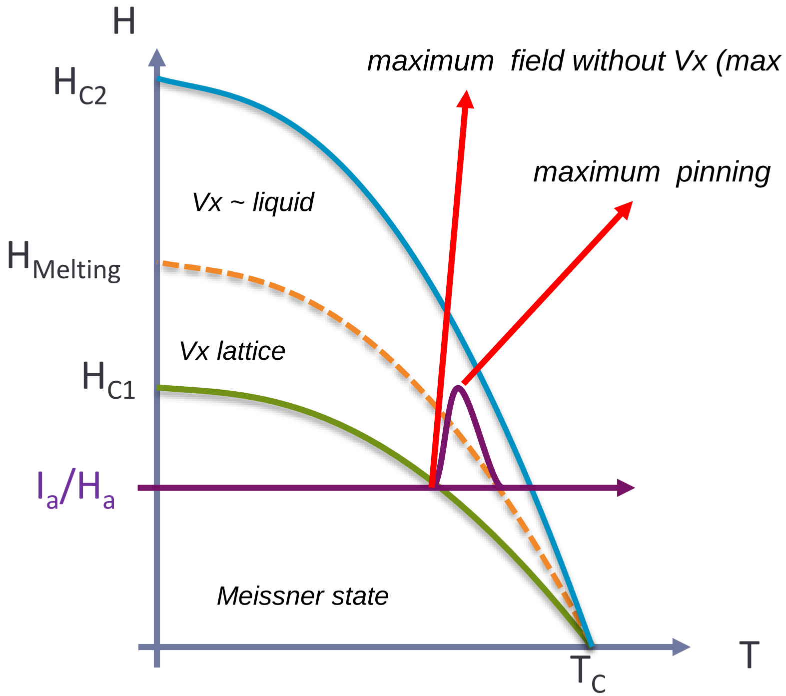
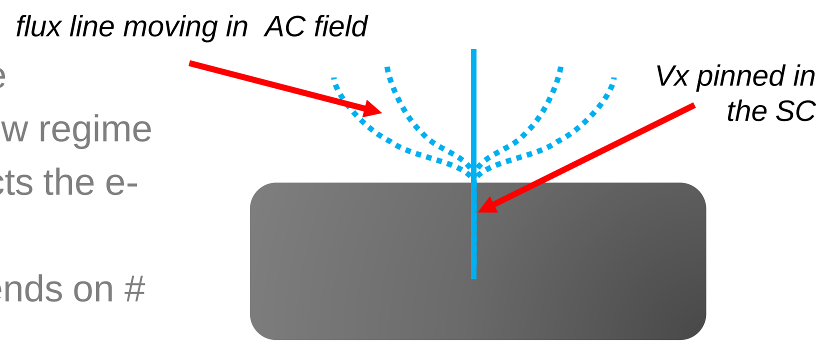
EXPERIMENTAL DETAILS



1[rst] design ~ 90 mT↑
2[nd] design: tested > 220 mT →

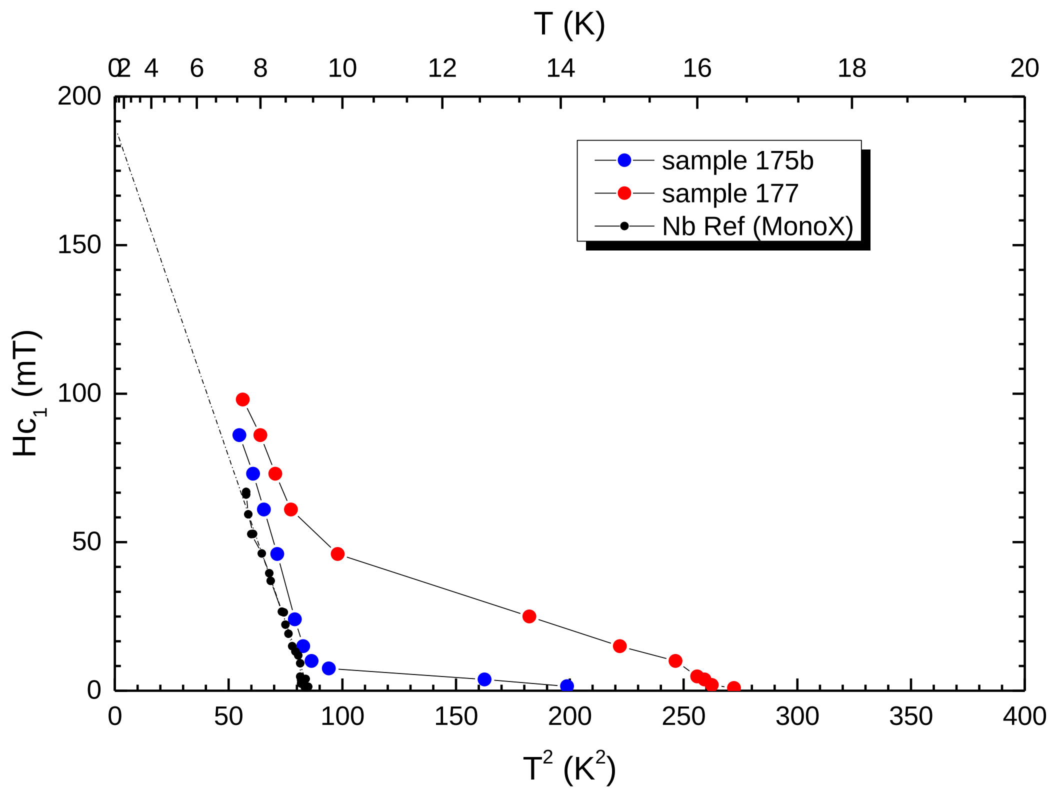


- **Low frequency ≡ DC :**
  - $0 < H_a < H_{C1}$ => R=O, Meissner state
  - $H_{C1} < H_a < H_M$ =>Vx are trapped, R=O, Campbell regime
  - $H_M < H_a < H_{C2}$ =>Vx are moving liquid like, R≠O, Flux flow regime
  - Third harmonic signal arise from flux line tension (affects the e- inside the Cu coil),
  - It does not depend on dissipation inside Nb, BUT depends on # of Vx trapped there (and length).



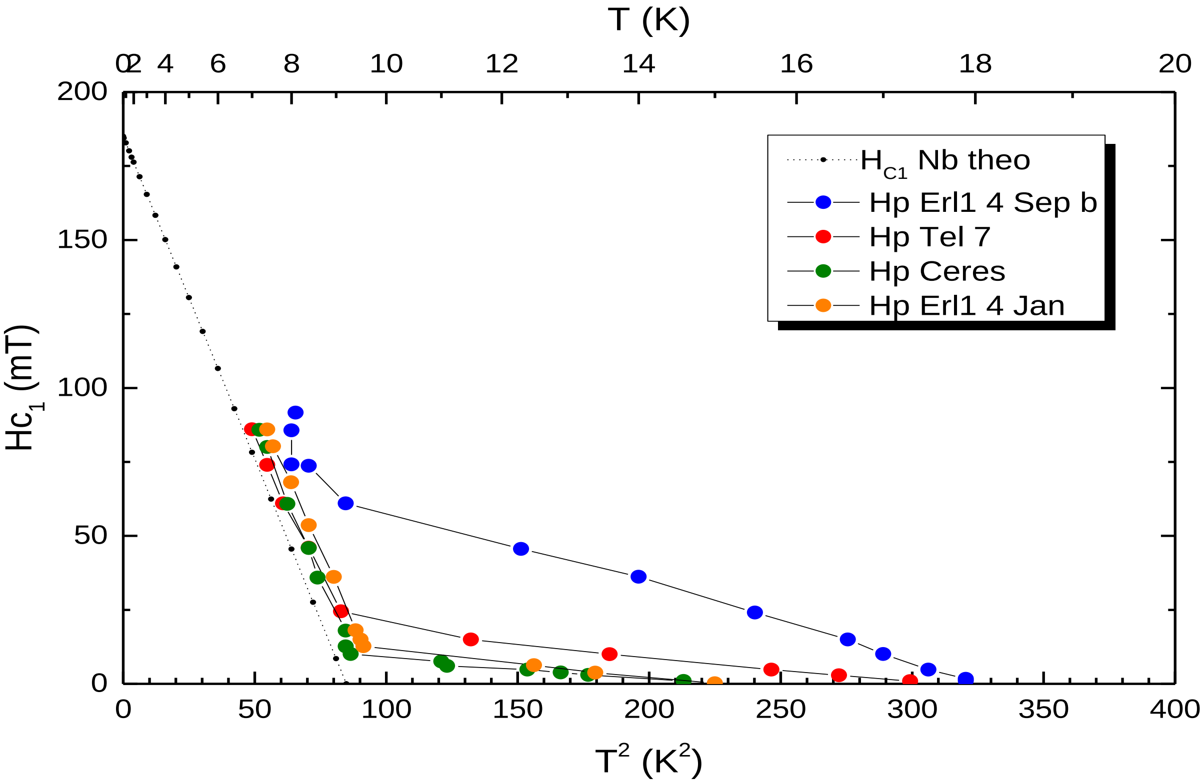
Multilayers Nb/AlN/NbTiN

- Samples from Jlab *[AM Valente-Felicianno, TBP]*



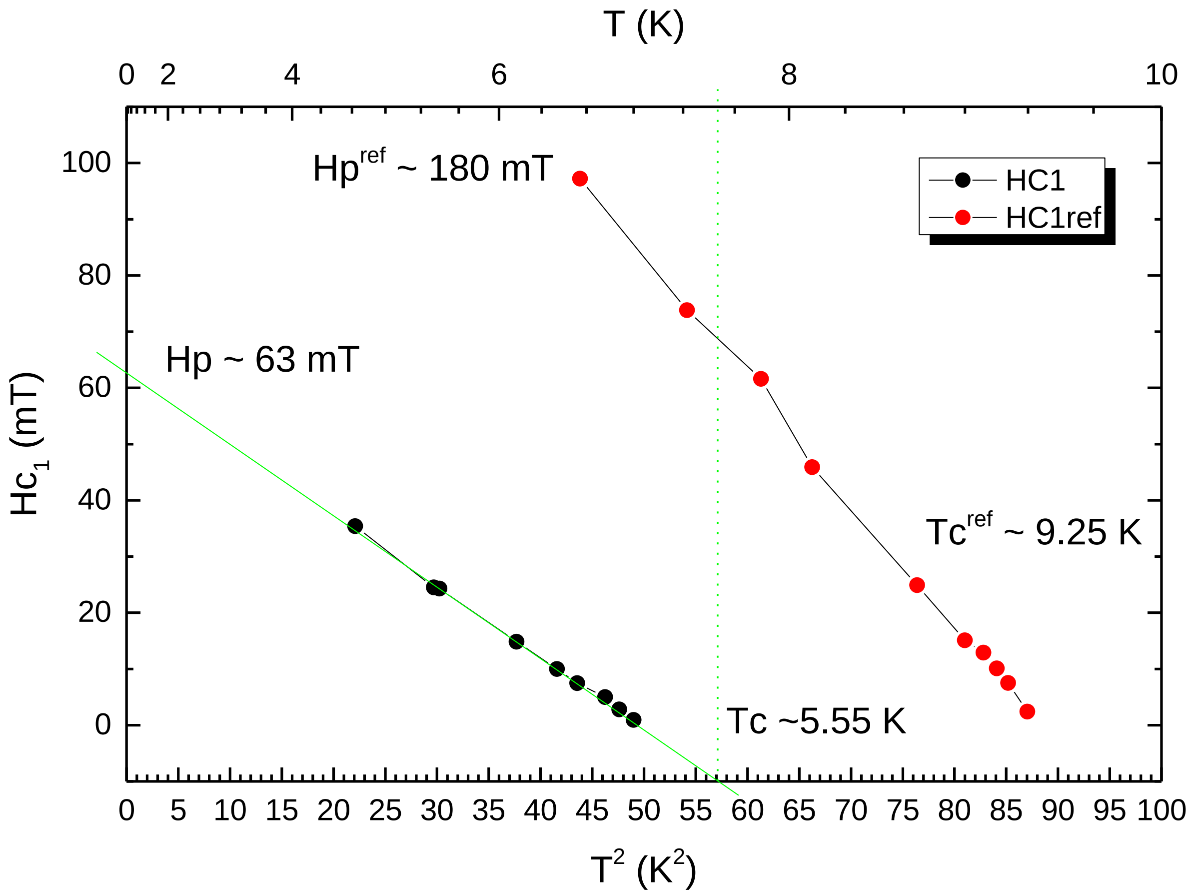
Nb_3Sn series

- Along with cavity results and PCT *[T. Proslier, TBP]*



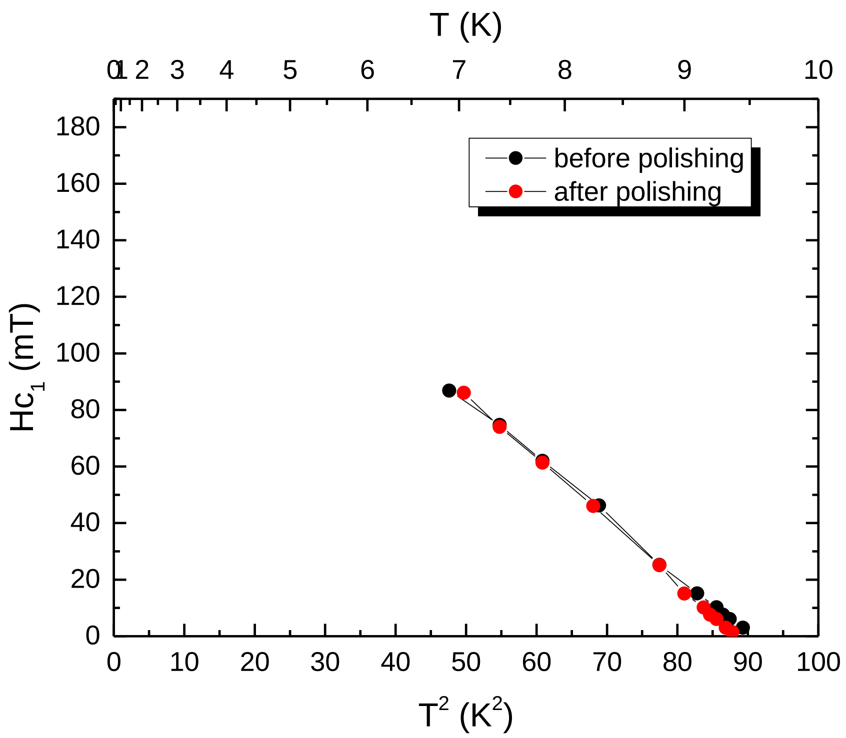
Thin films

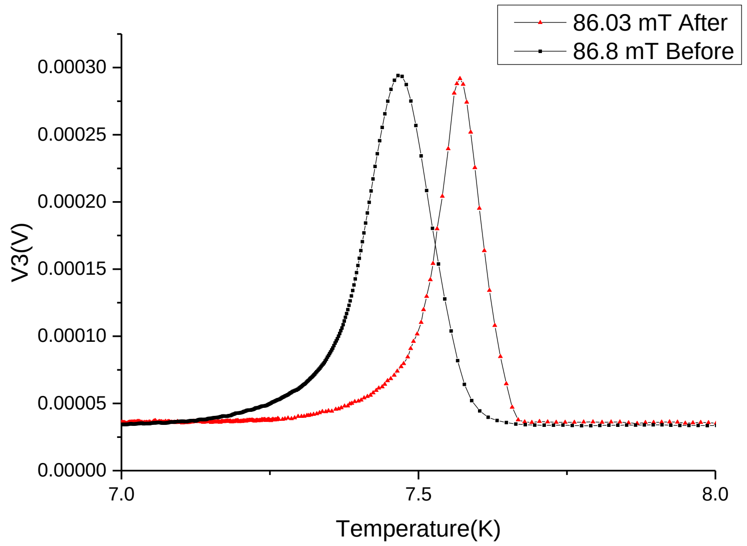
- *HPIMS sample from Dephi-Fr*



Damage layer

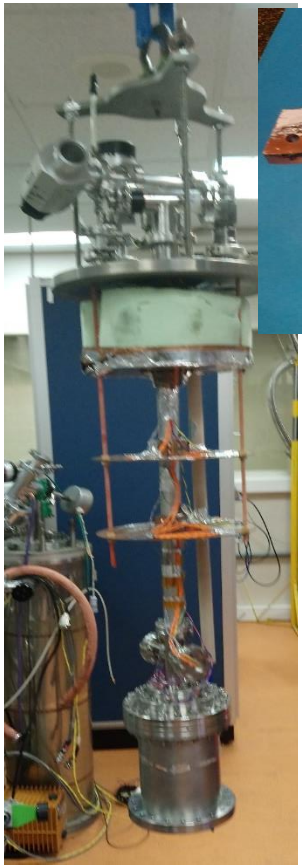
- *Nb monocrystal before (BCP)/after final polishing*

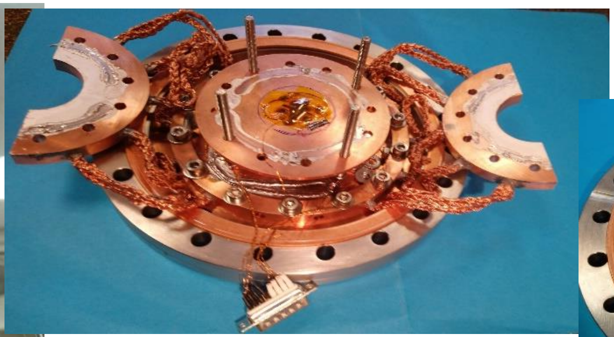


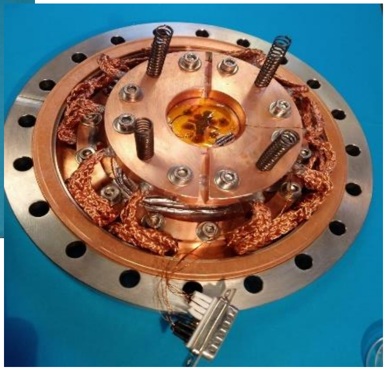


MAGNETOMETER: NEW DESIGN

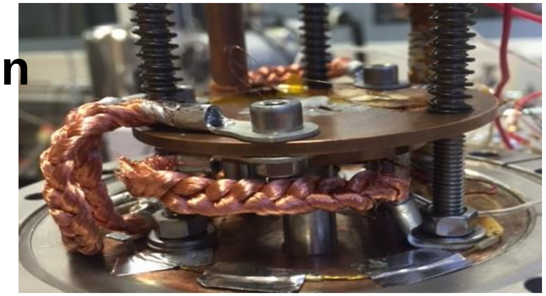
Careful thermal design



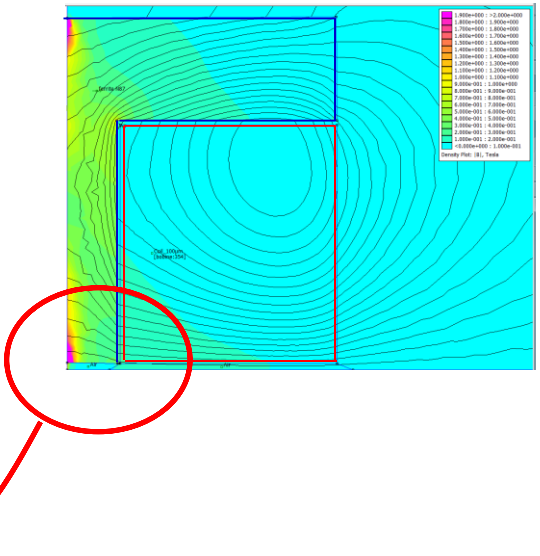


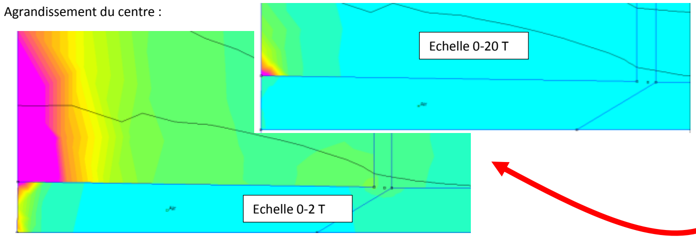


- **Initial design**
  - Limited to ~90 mT

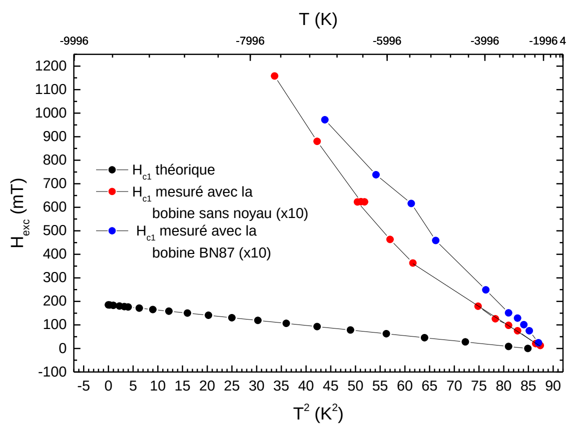


- **New design:**
  - Stable ~ 130 mT @ 5,5 K (Nb transition)
  - Tested up to ~220 mT
  - Issue : need for larger samples
  - Or concentrate the field with ferrite (collab CRISMAT)→

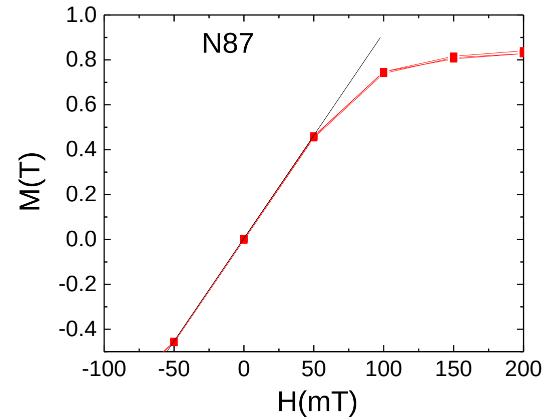




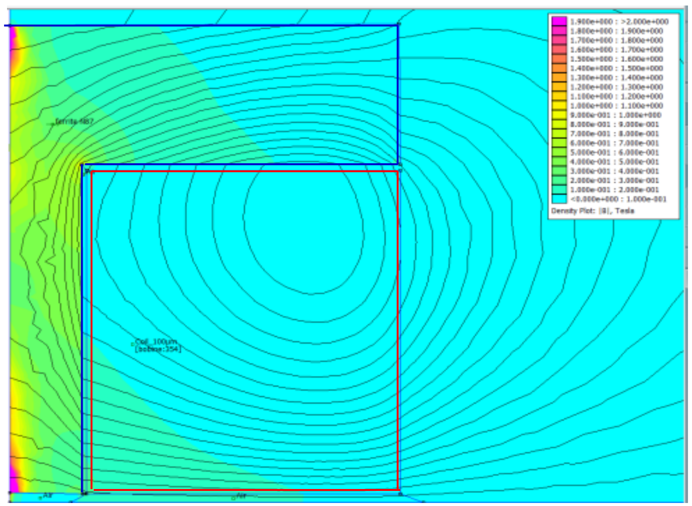
ISSUES

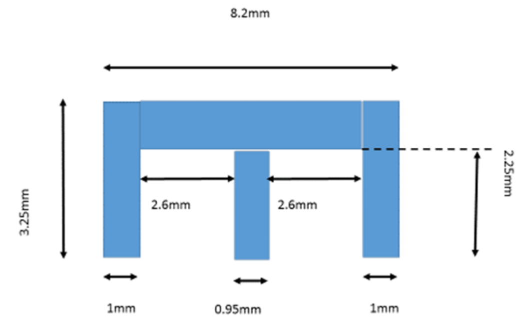


T (K)
-9996
-7996
-5996
-3996
-1996
4
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
-100
H_{exc} (mT)
H_{c1} théorique
H_{c1} mesuré avec la bobine sans noyau (x10)
H_{c1} mesuré avec la bobine BN87 (x10)
-5
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
T^2 (K^2)



N87
1.0
0.8
0.6
0.4
0.2
0.0
-0.2
-0.4
M(T)
-100
-50
0
50
100
150
200
H(mT)





8.2mm
3.25mm
2.6mm
2.6mm
2.25mm
1mm
0.95mm
1mm