



I E E INSTITUTE
S A S OF ELECTRICAL
ENGINEERING SAS

Institute of Electrical Engineering SAS

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SC characterization at IEE Bratislava

IEE OVERVIEW

Sample Batches investigated/received:

prepared at *Uni Siegen*:

- **NbTiN** films on **Si** substrate – *23.11.2023 series* (30)
measured Bag1 (6), rest in progress

prepared at *STFC Daresbury*:

- **Nb₃Sn** films on **Cu** and **Sapphire** substrates – *1.12.2023 series* (6)
measured
- **Nb₃Sn** , **Nb** films on **Cu** substrate – *12.1.2024 series* (7)
measured Nb₃Sn (3), rest in progress
- **Nb** , (**Nb₃Sn** , **NbTiN**) films on **Cu** substrate – *23.2.2024 series* (7)
waiting

prepared at *INFN Legnaro*:

- **Nb₃Sn** films on **Cu**, **Cu+Nb** and **Sapphire** substrates – *8.2.2024 series* (6+3)
measured Run#33 (3), rest in progress

Currently going into a Shutdown for maintenance, repairs,
in hope for resolving the Temperature stability and cooling issues.

Table-summary

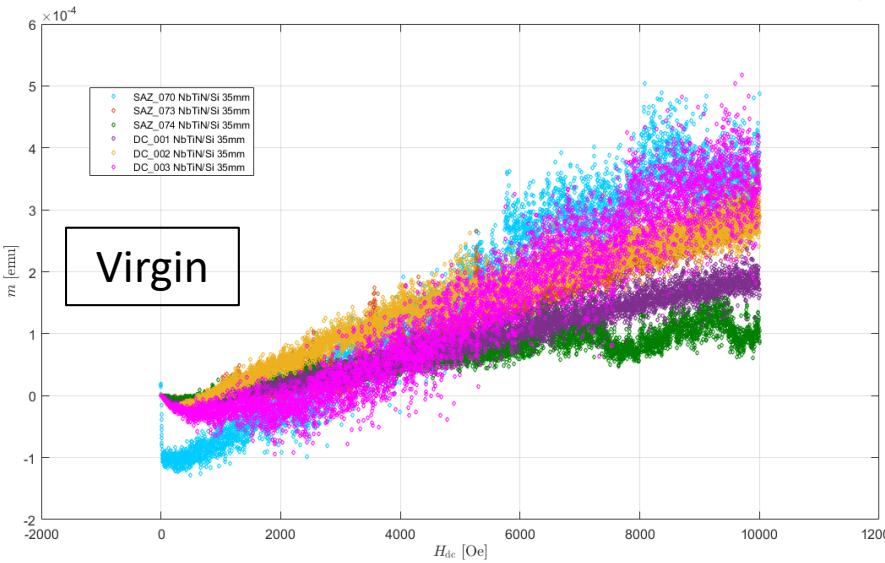
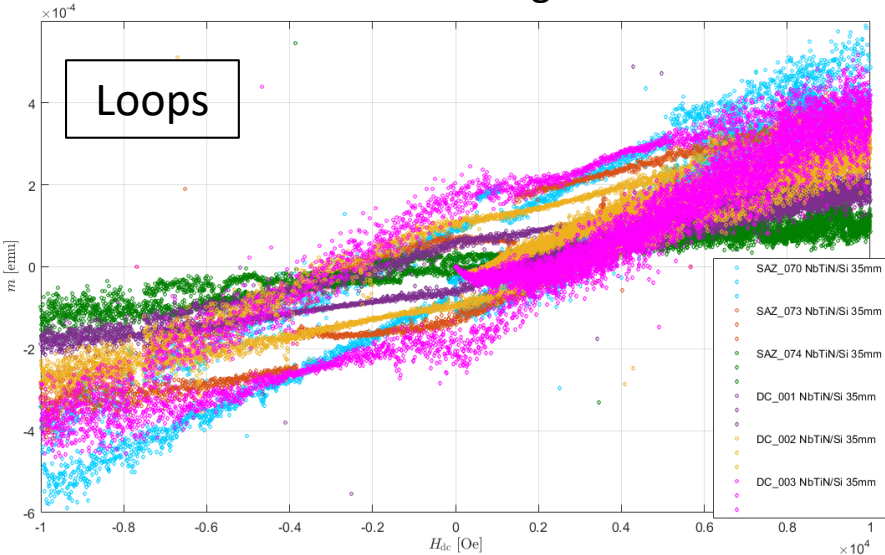
	Sample	Ben [Oe] (2% crit. at 4.22 K)		Tc [K]	Sample	Ben [Oe]		Tc [K]
		Perpend	Parallel			perp.	Parallel	
NbTiN	DC_001_recentre		870	13.8	DC_001		160	13.7
Substrate: Si	DC_002_recentre		paramag.	14.1	DC_002		130	14.2
	DC_003_recentre		670	13.7	DC_003		150	13.8
UNI Siegen	SAZ_070_recentre		25	13.5	SAZ_070		20	13.2
23.11.2023 series	SAZ_073_recentre		570	10.3	SAZ_073		150	12.7
	SAZ_074_recentre		600	12	SAZ_074		110	13.6
	(SAZ_074 B-sample_recentre)		25	14.5				
Nb3Sn	Cu_28_06_23		160	17				
Substrates: Cu, Sapphire	Cu_06_07_23		530	16.5	Cu_06_07_23_recentre		420	16.5
	Cu_24_07_23		350	17	Cu_24_07_23_recentre		190	16.1
STFC	Cu_08_12_23		300	16.7	Cu_08_12_23_recentre		700	16
1.12.2023 series	Sapp_28_06_23		50	17.5	Sapp_28_06_23_recentre		60	17.6
	Sapp_06_07_23		60	17.5	Sapp_06_07_23_recentre		60	17.4
Reza	Cu_RTdep_510C		430	14.7	Cu_RTdep_510C_recentre		100	14.7
	Sapp_24_07_23		930	17.5	Sapp_24_07_23_recentre		1080	17.6
	Cu_RTdep_340C		-	-	Cu_RTdep_340C		-	-
Nb3Sn	Cu_CD3MM-020		610	16.8	Cu_CD3MM-020_recentre		610	16.8
Substrate: Cu	Cu_CD3MM-002		740	16.8	Cu_CD3MM-020_recentre		700	16.8
12.1.2024 series	Cu_CD3MM-015		580	16	Cu_CD3MM-015_recentre		550	16
STFC								
D.Seal								
Nb3Sn	Cu_Run33		300	13.2	Cu_Run33_recentre		290	13.2
Substrate: Cu, Sapphire	Cu_Run33_50Nb		700	9.3 + 16.8	Cu_Run33_50Nb_recentre		720	16.8
8.2.2024 series	Sapp_Run33		860	16.8	Sapp_Run33_recentre		900	16.8
INFN								
Dorothea Fonnesu								

“Mystery issues” regarding sample centering in the VSM coil pair

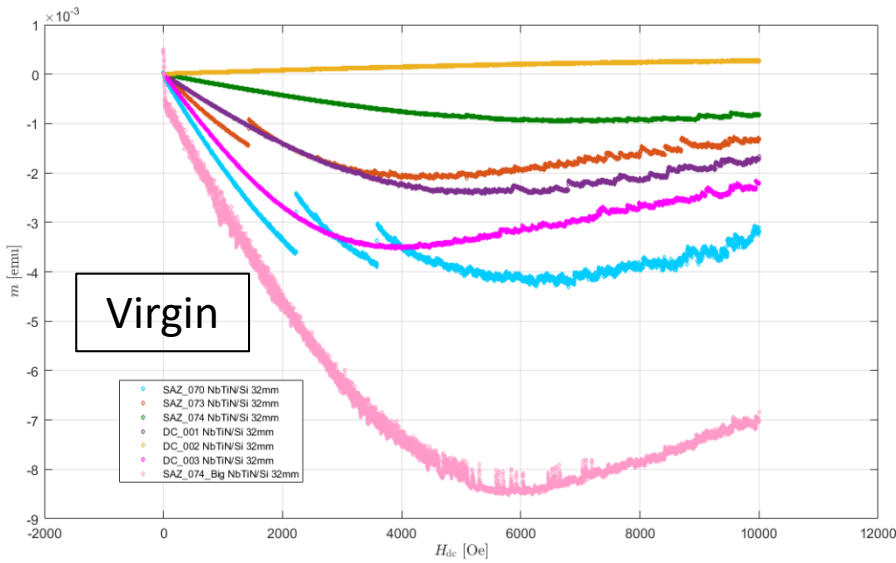
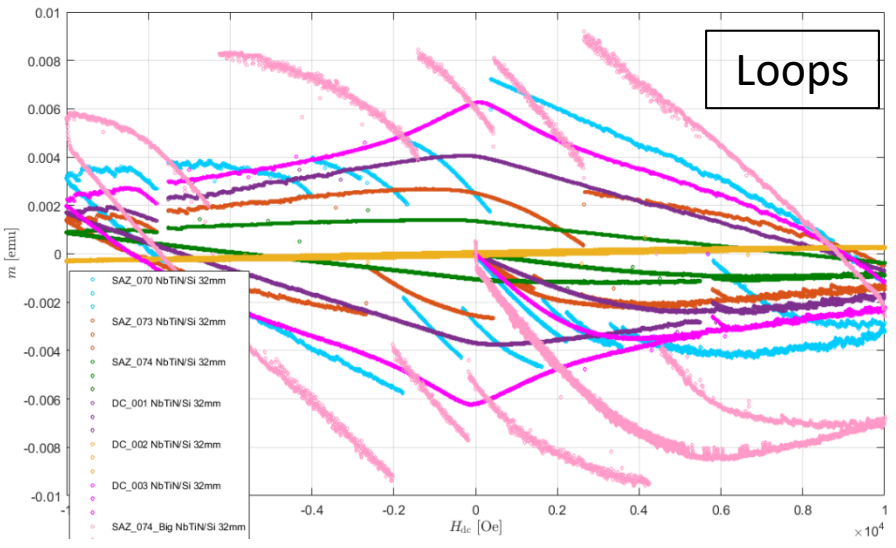
Majority of samples measured in a standard and in a shifted position (‘_recentre’)

NbTiN / Si UniSiegen (23.11.2023 series, Bag1)

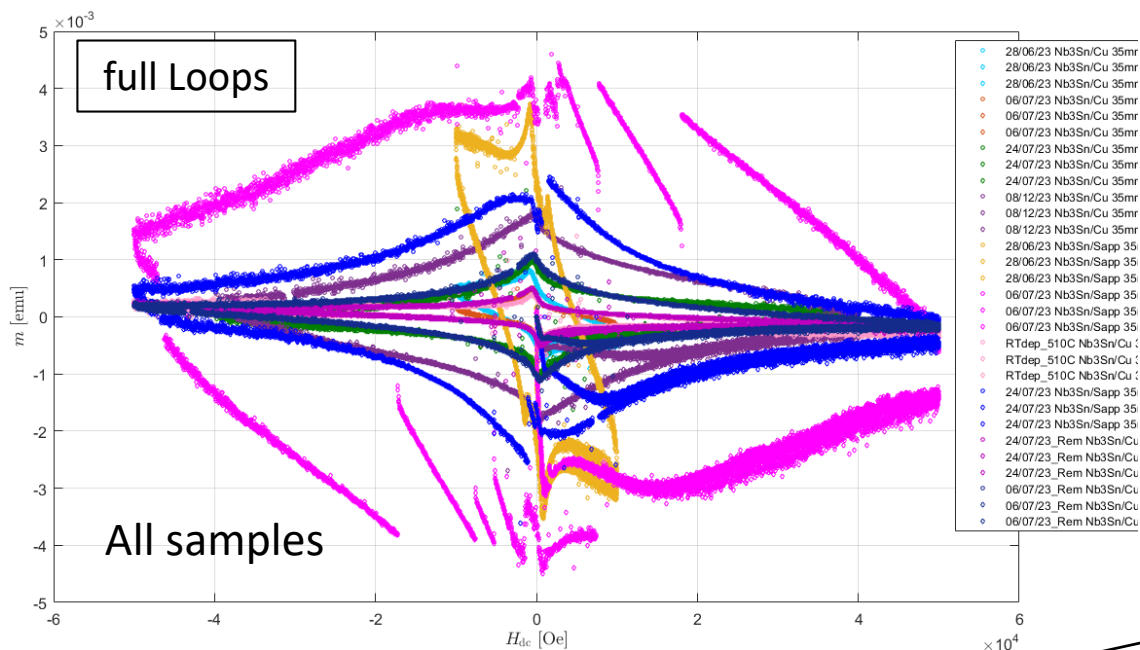
standard centering - 35mm



“recentre” - 32mm

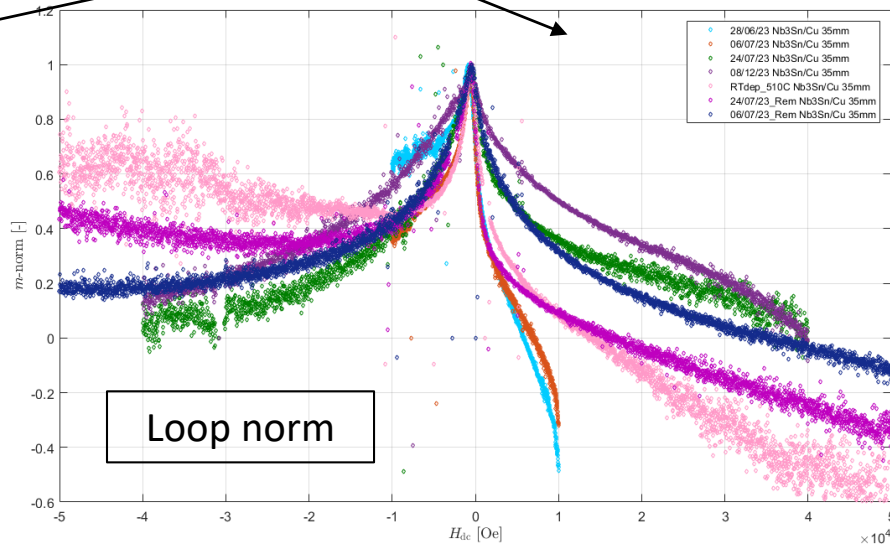
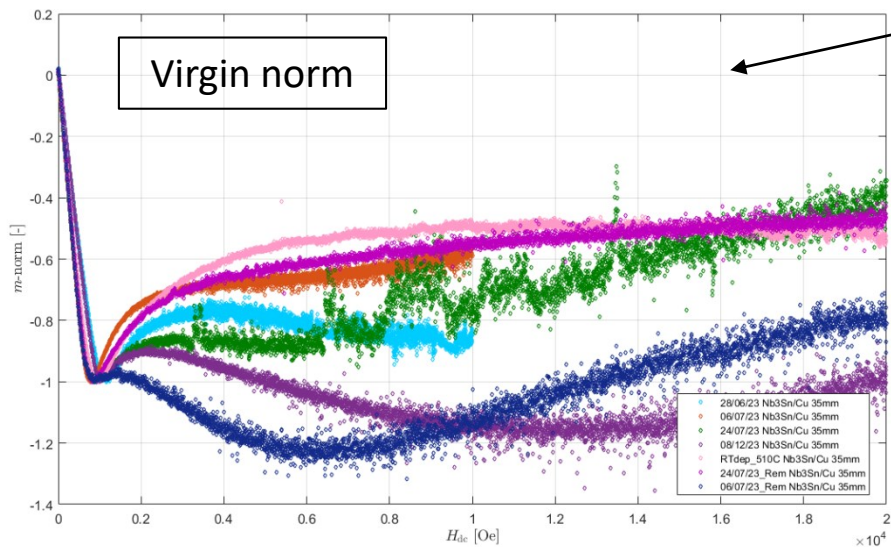


Nb₃Sn / Cu,Sapp STFC (1.12.2023 series)



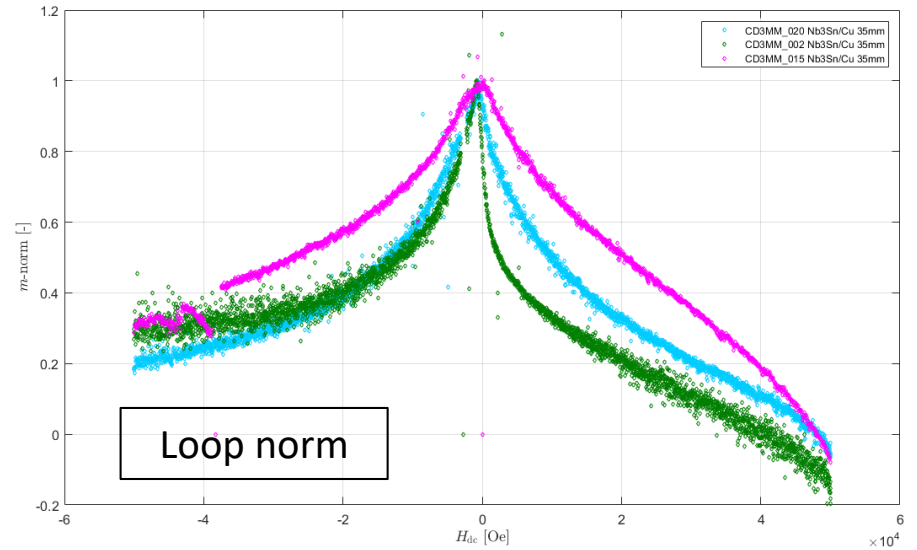
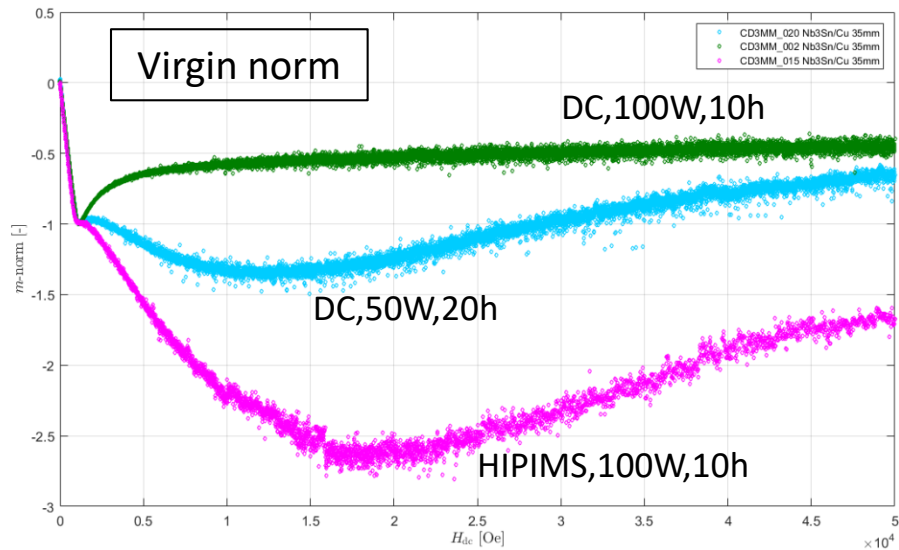
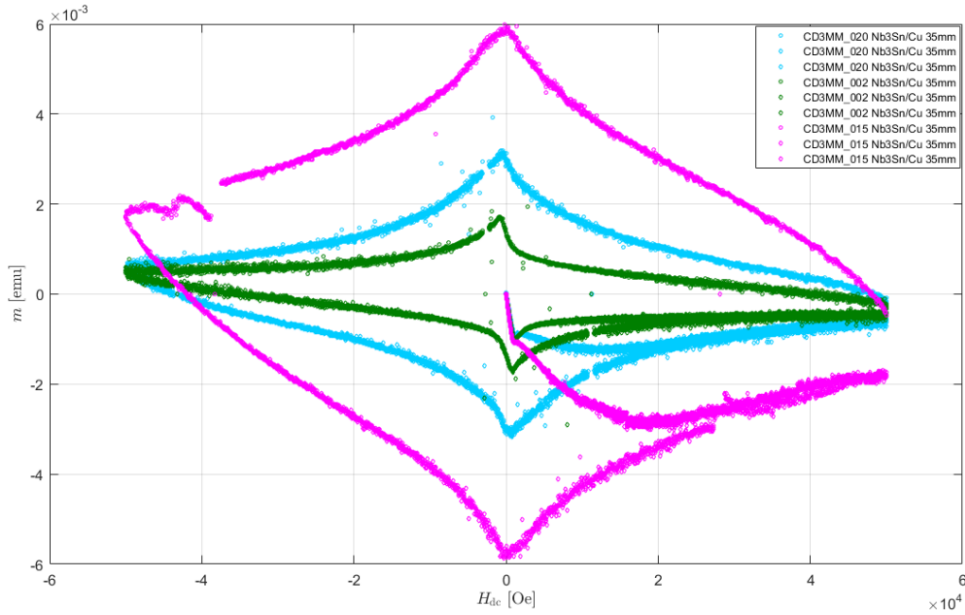
Standard centering (35mm) shown here

without Sapphire samples



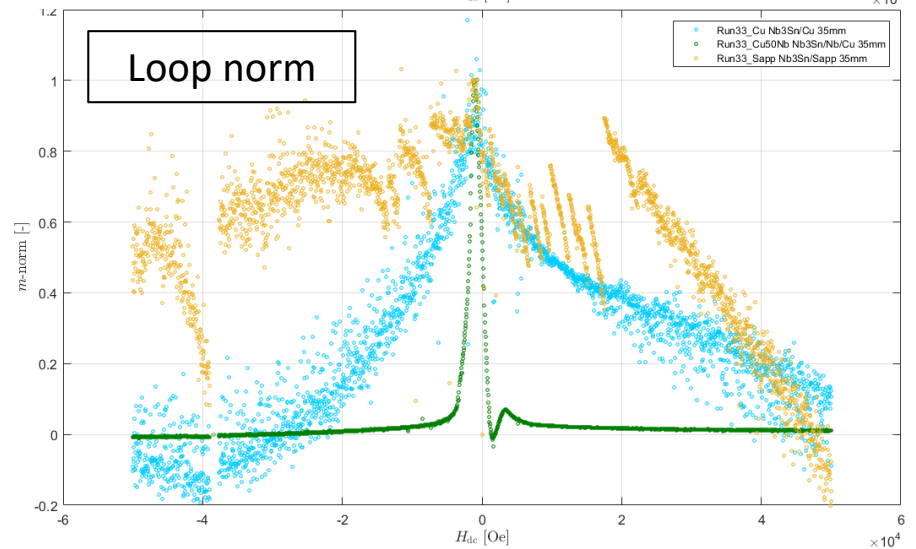
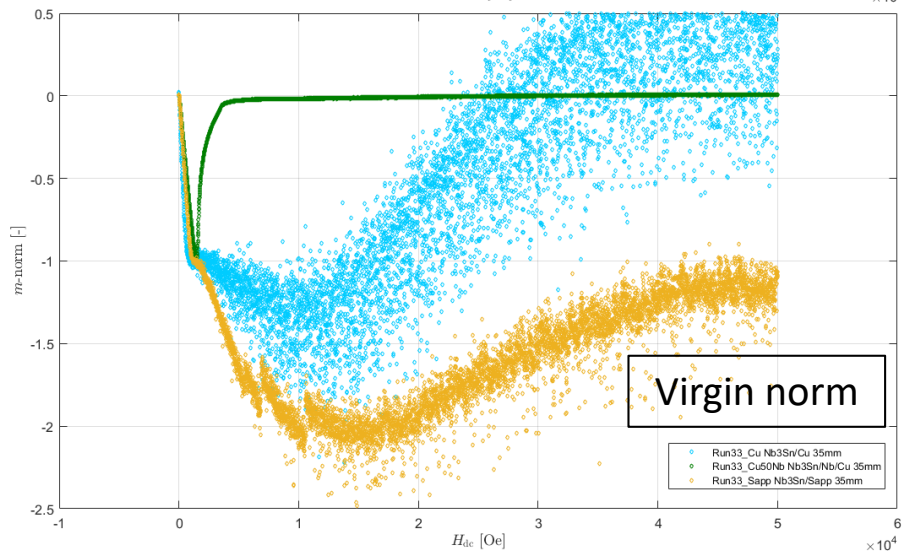
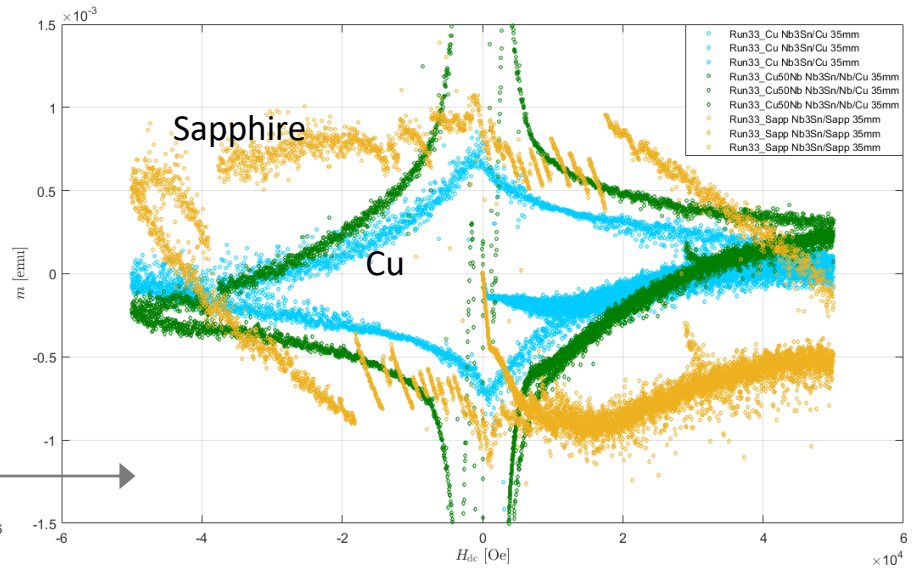
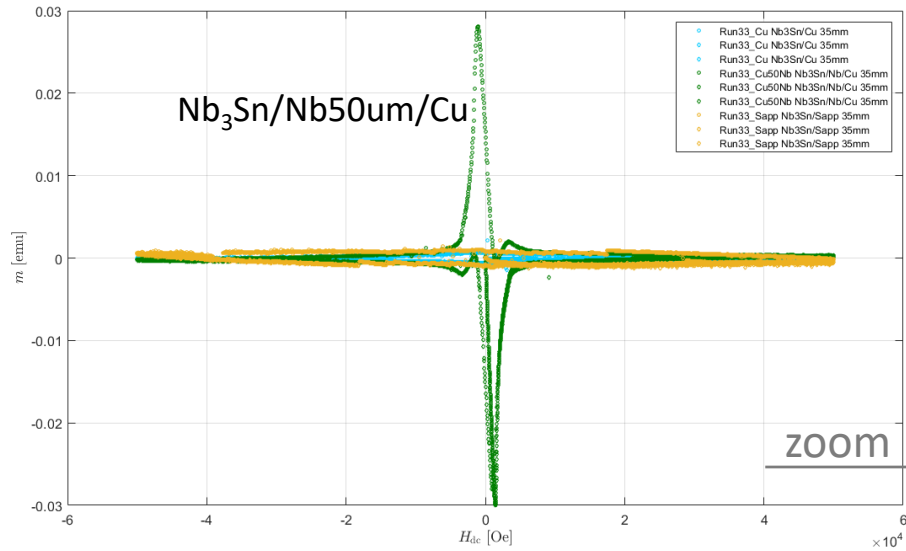
Nb₃Sn / Cu STFC (from 12.1.2024 series)

Standard centering (35mm)



Nb₃Sn / Cu,Cu+Nb,Sapp INFN (Run 33, 8.2.2024 series)

Standard centering (35mm)



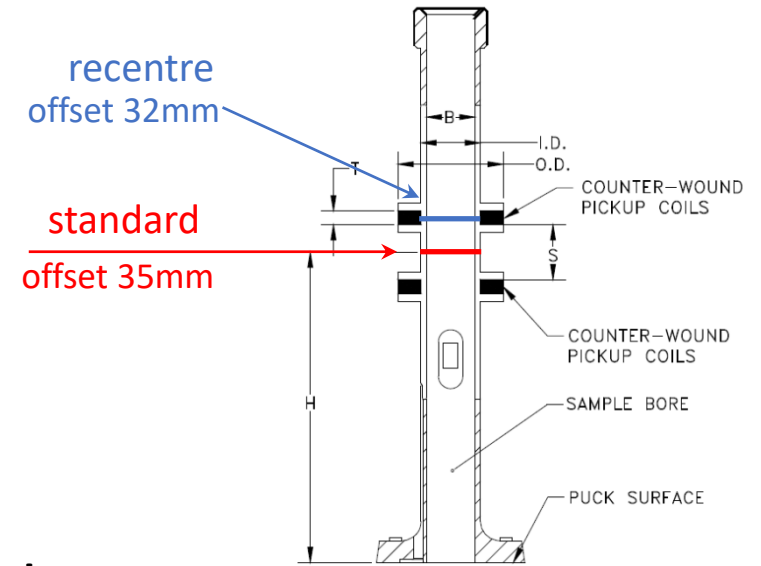
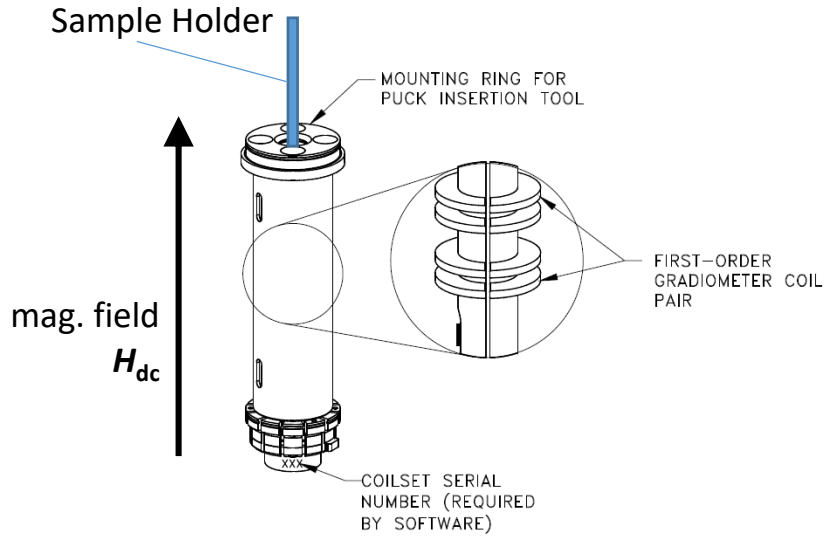
Run 33: deposition 600°C, Nb₃Sn-1μm

Sapphire sample – ‘Smash-cleaving’

Thank you for your attention

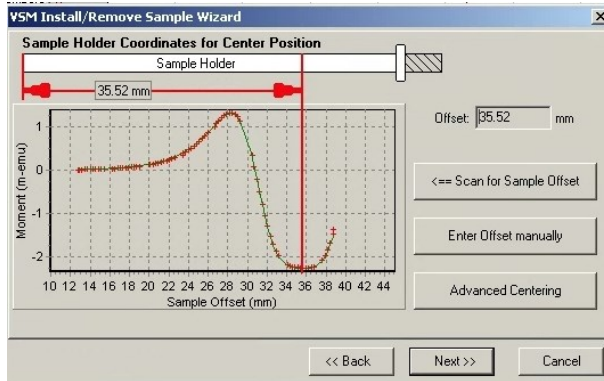
Appendix: Sample centering issues

Brief introduction

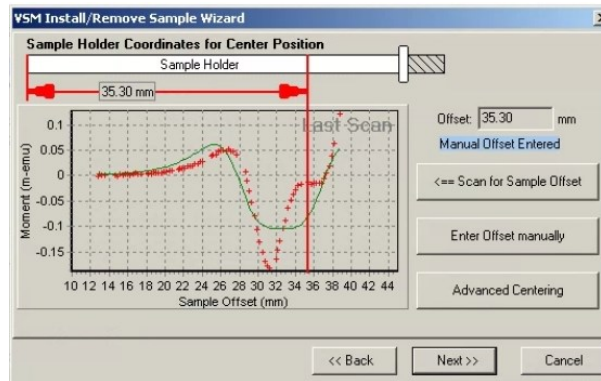


Moment vs. Sample Offset

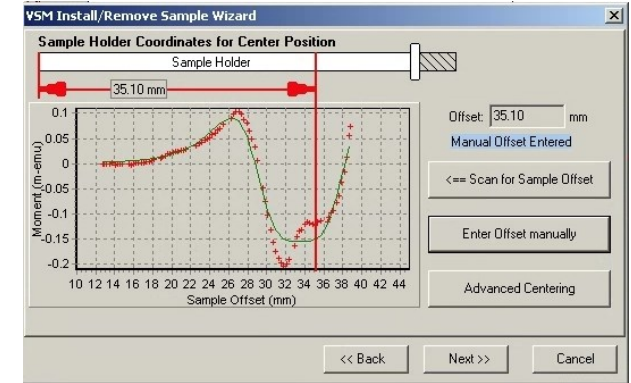
Usual @SC samples (Nb, HTS,...)



NbTiN/Si samples (23.11.2023)

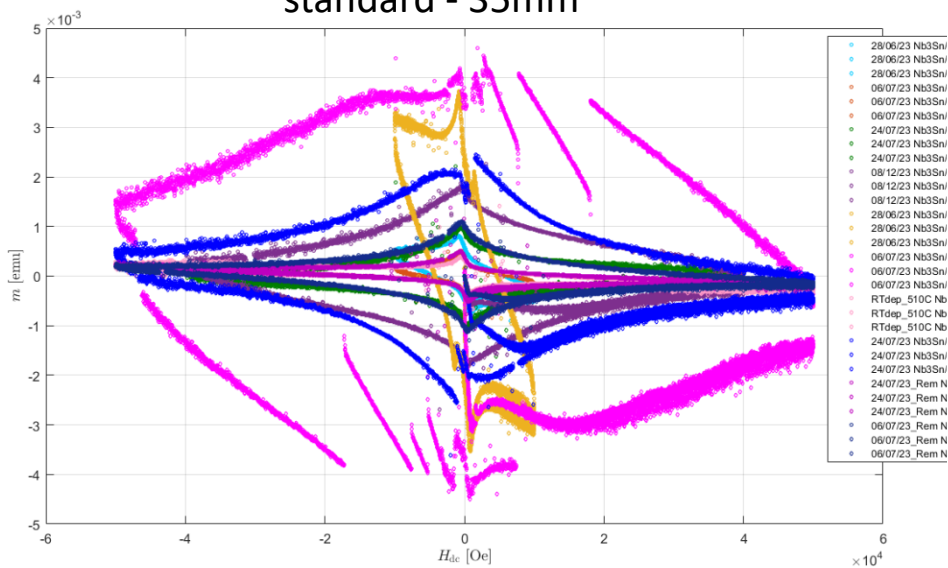


Nb₃Sn samples

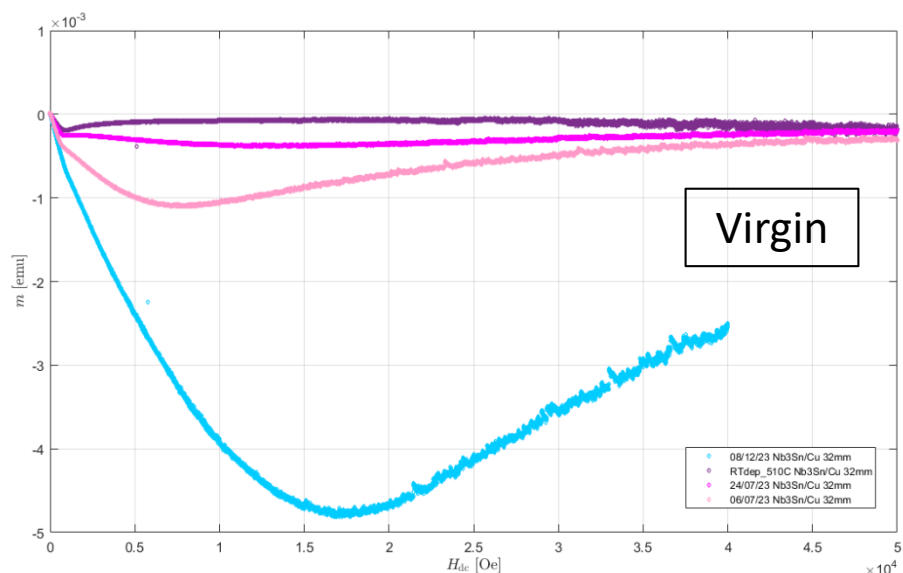
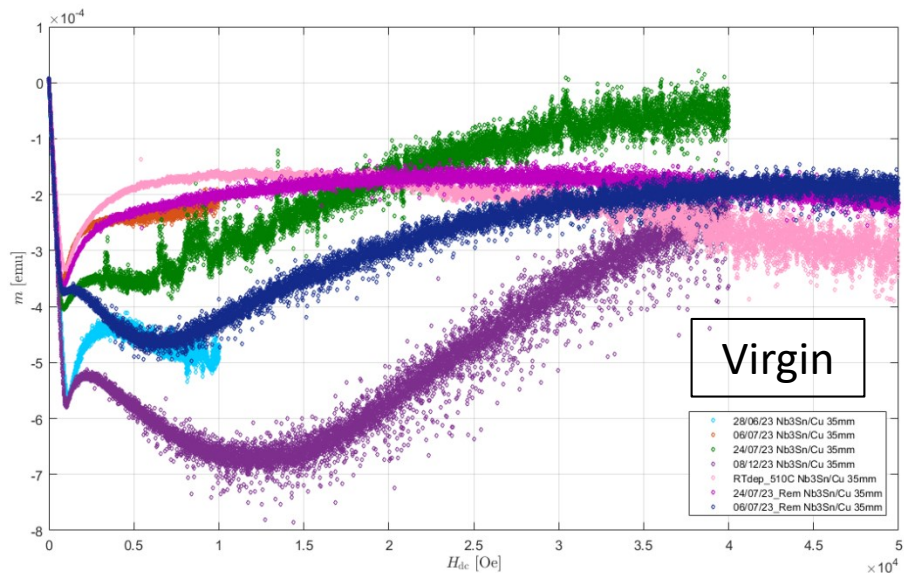
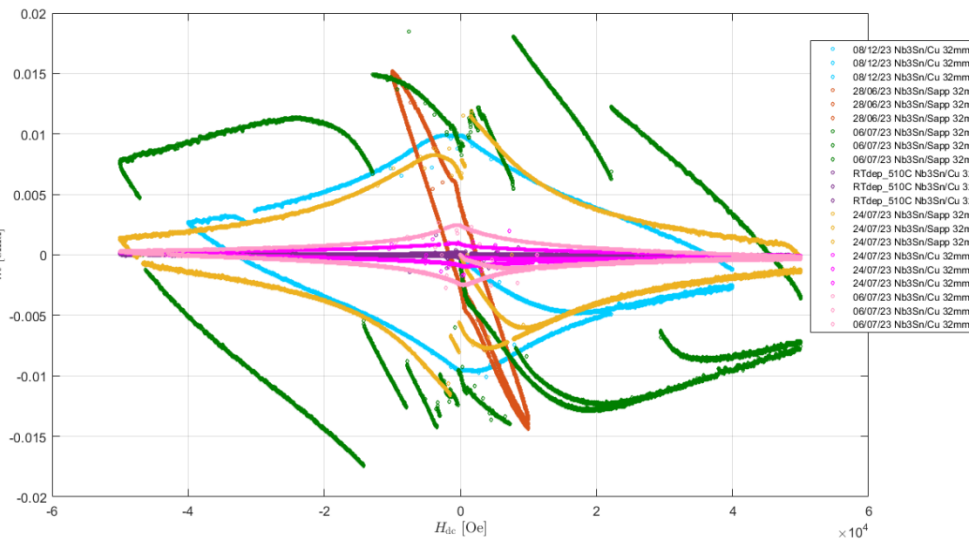


Nb₃Sn / Cu,Sapp STFC (1.12.2023 series)

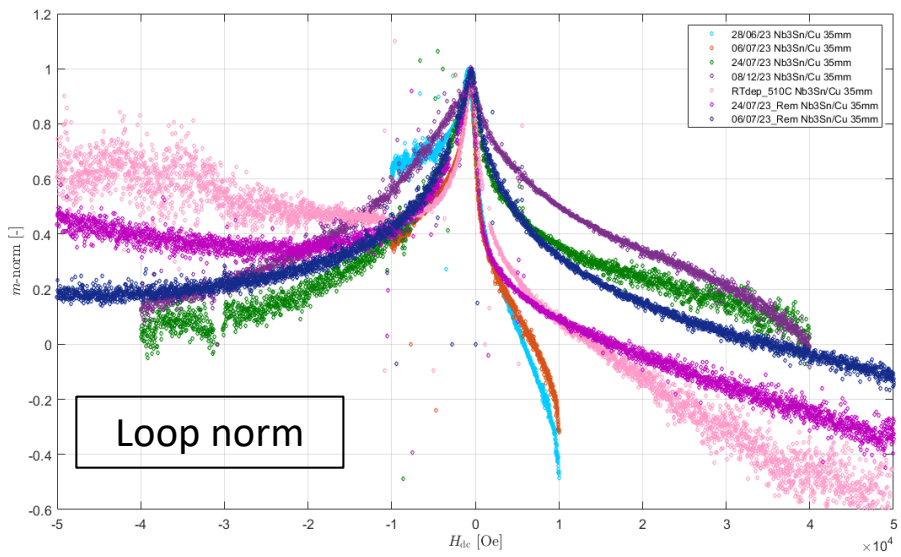
standard - 35mm



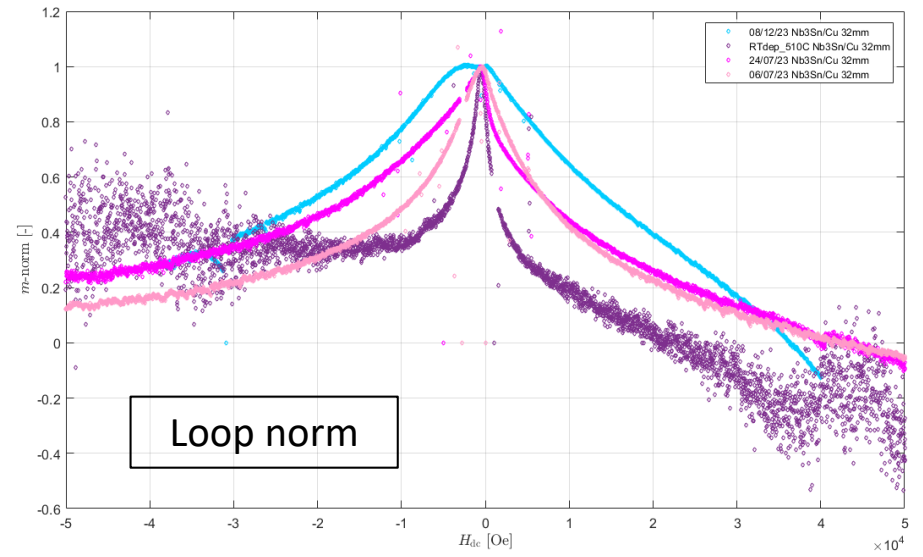
recentre - 32mm



standard - 35mm

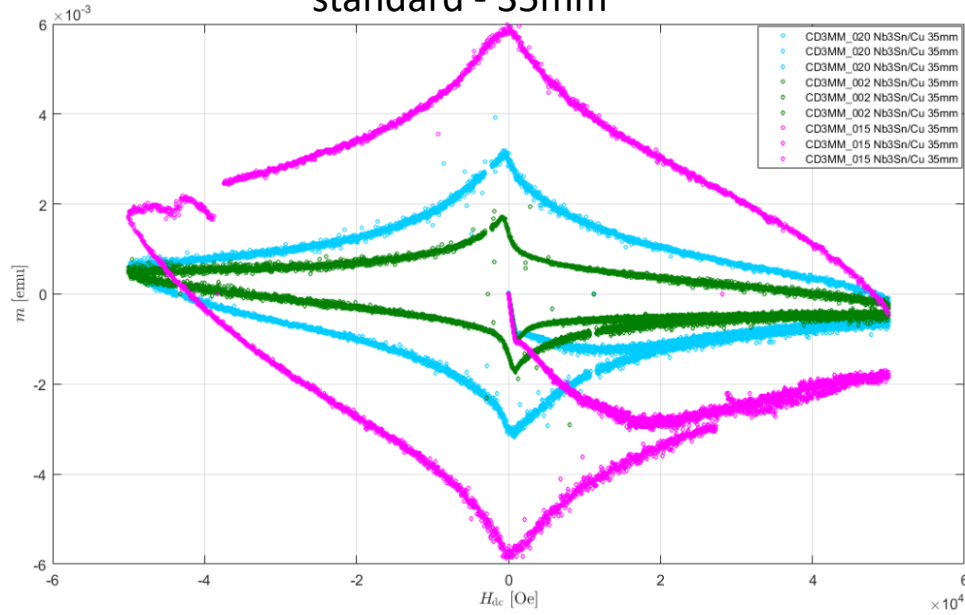


recentre - 32mm

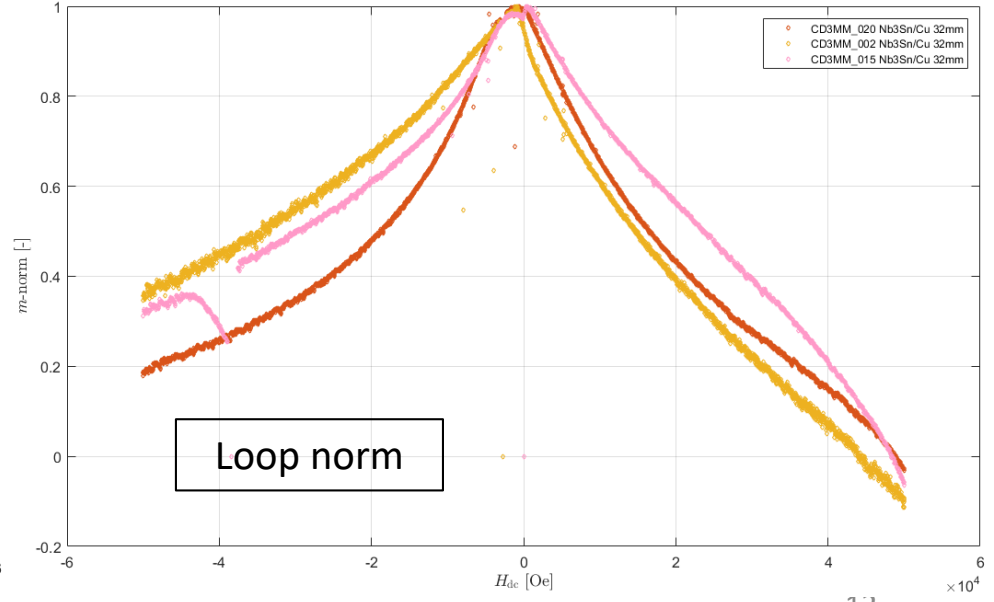
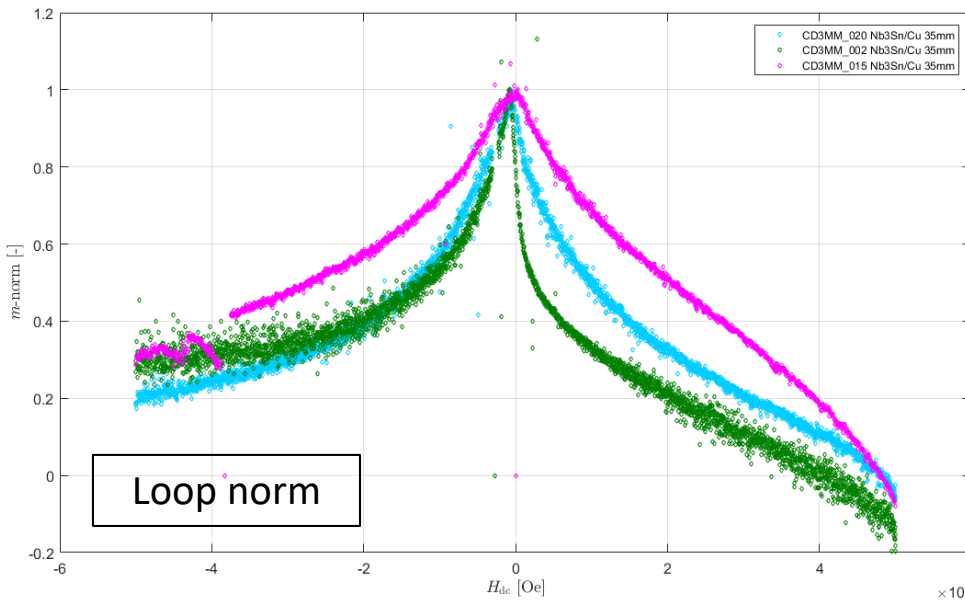
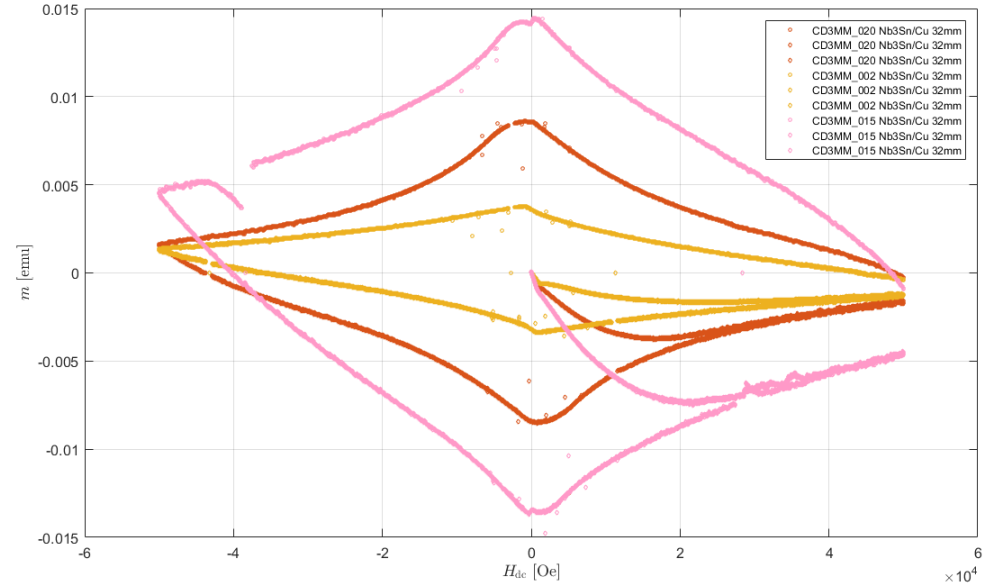


Nb₃Sn / Cu STFC (from 12.1.2024 series)

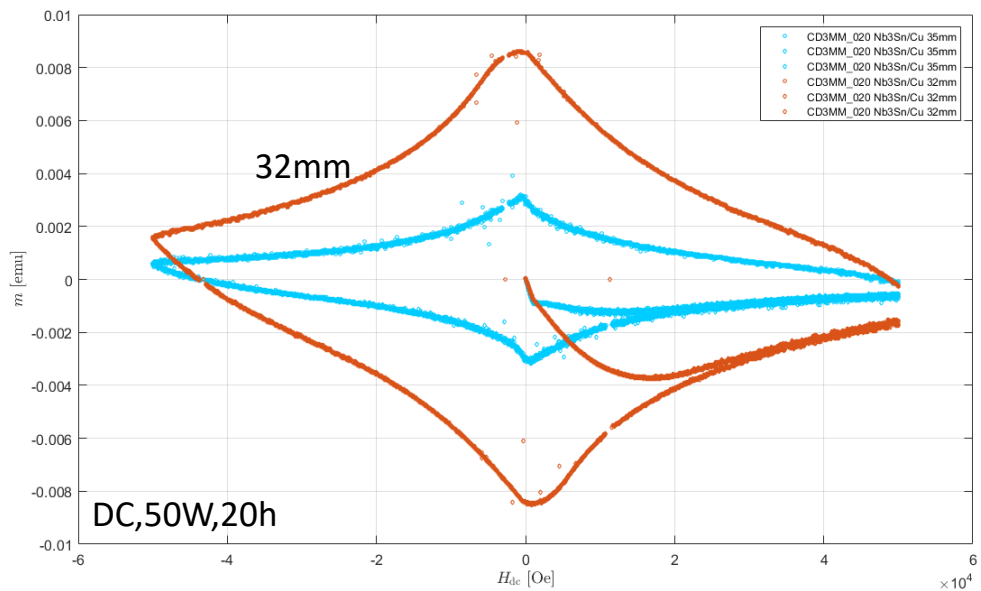
standard - 35mm



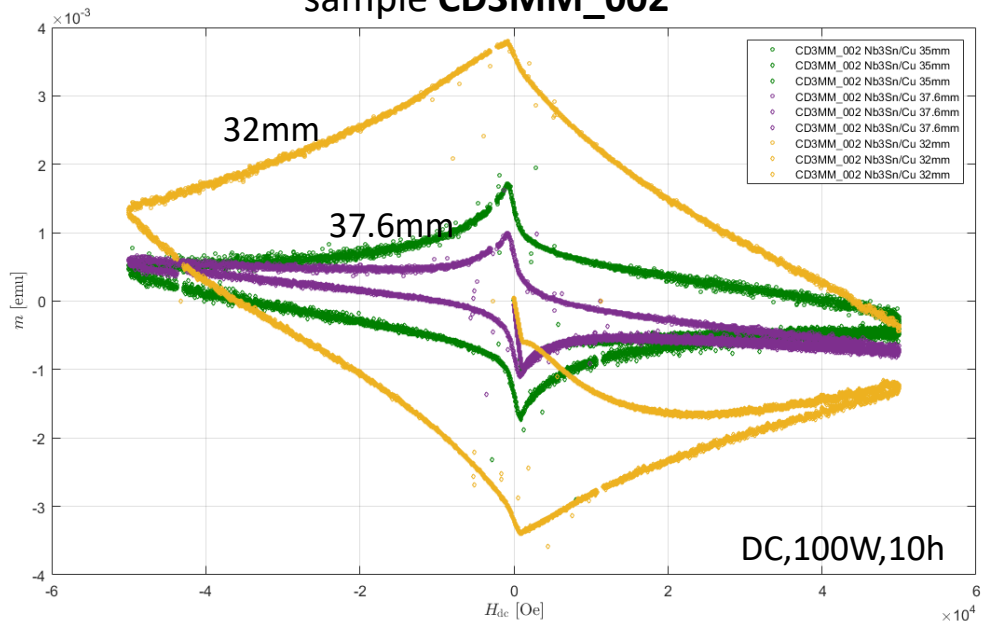
recentre - 32mm



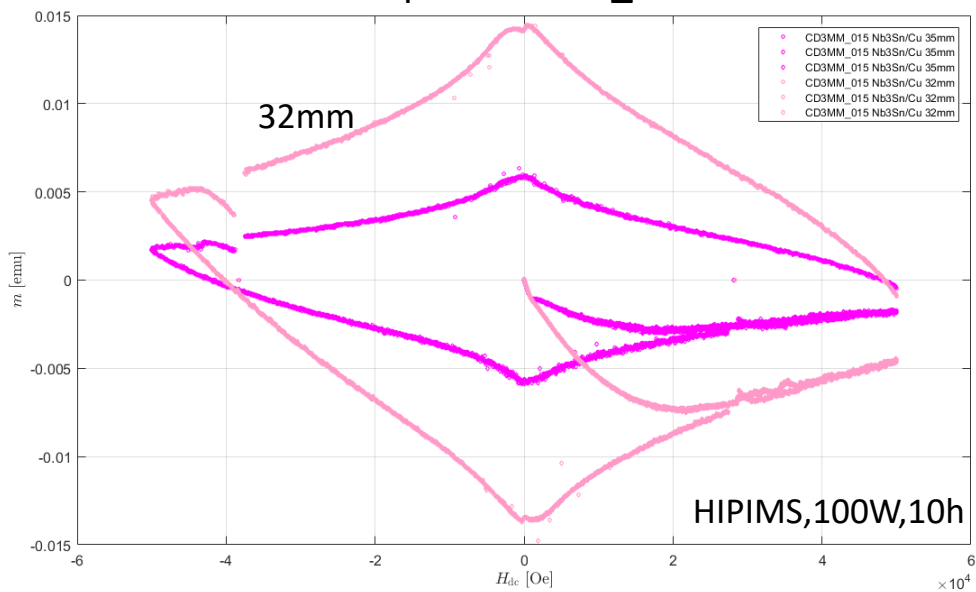
sample **CD3MM_020**



sample **CD3MM_002**

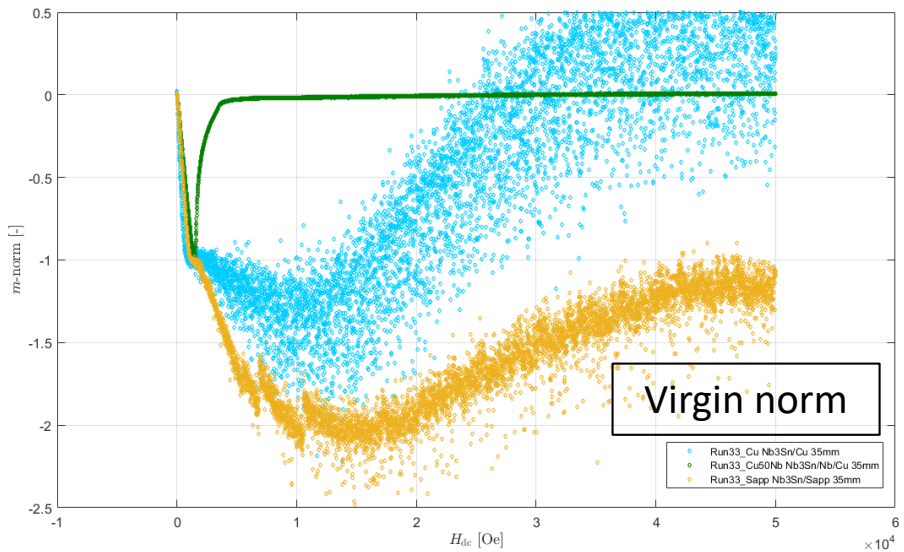
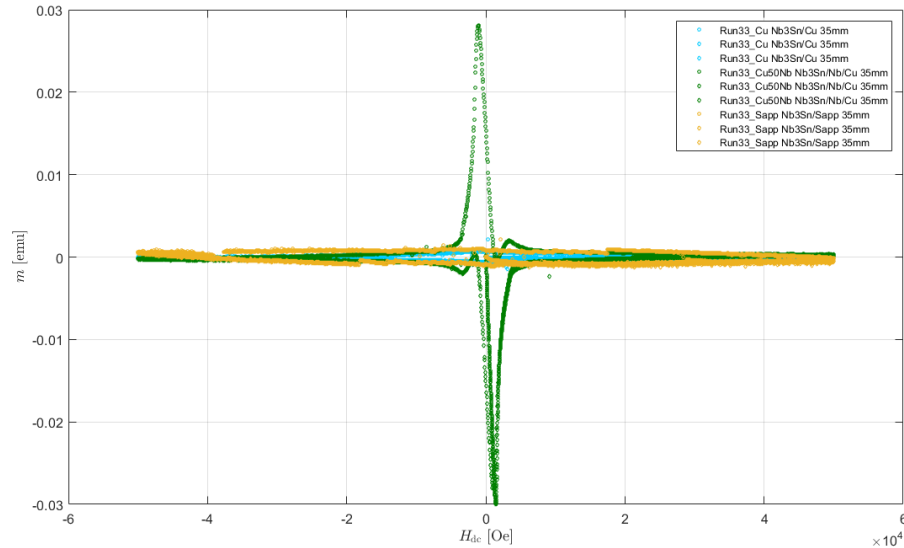


sample **CD3MM_015**

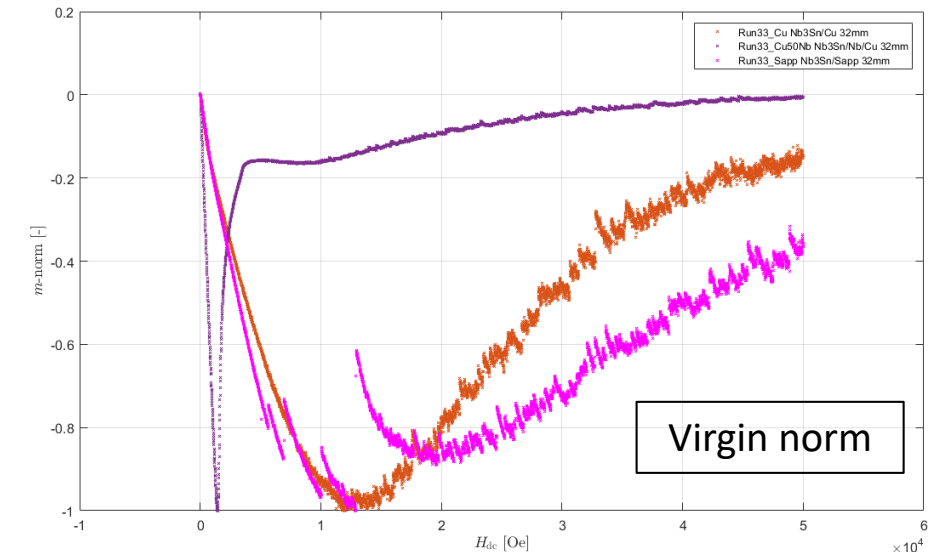
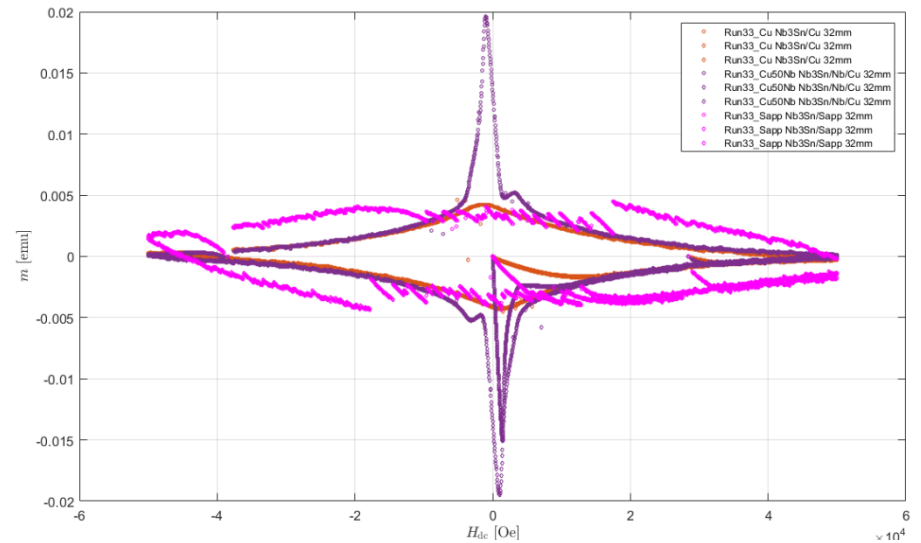


Nb₃Sn / Cu,Cu+Nb,Sapp INFN (Run 33, 8.2.2024 series)

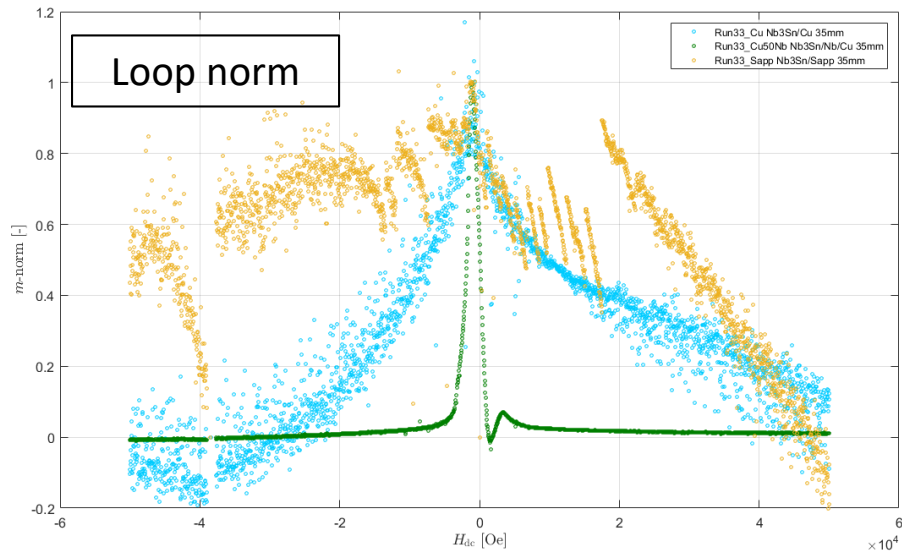
standard - 35mm



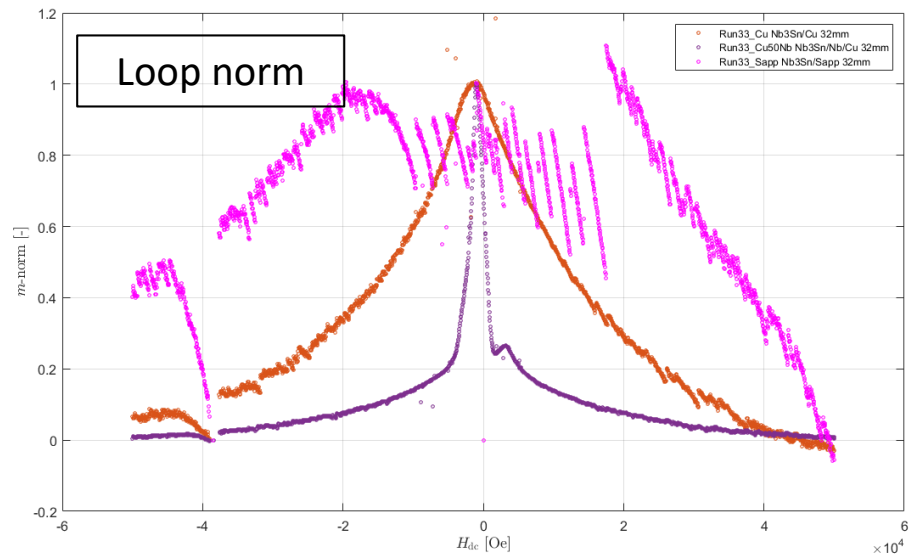
recentre - 32mm

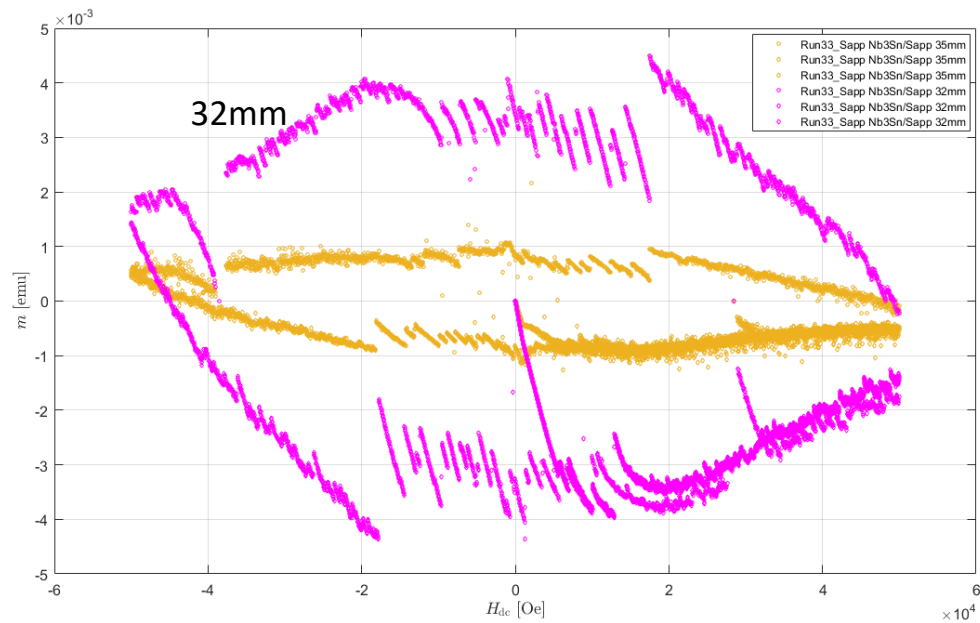
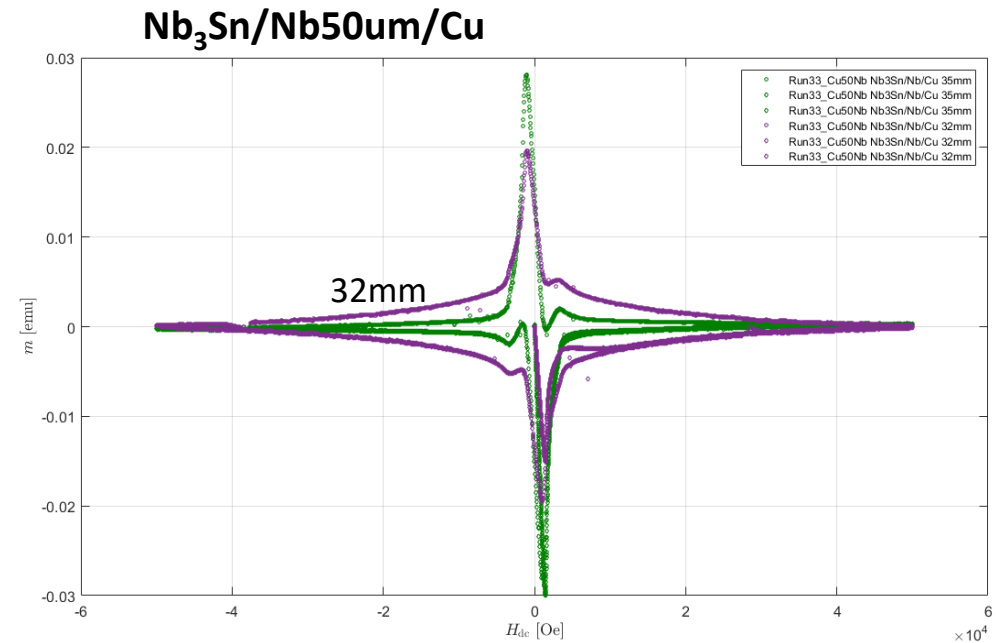
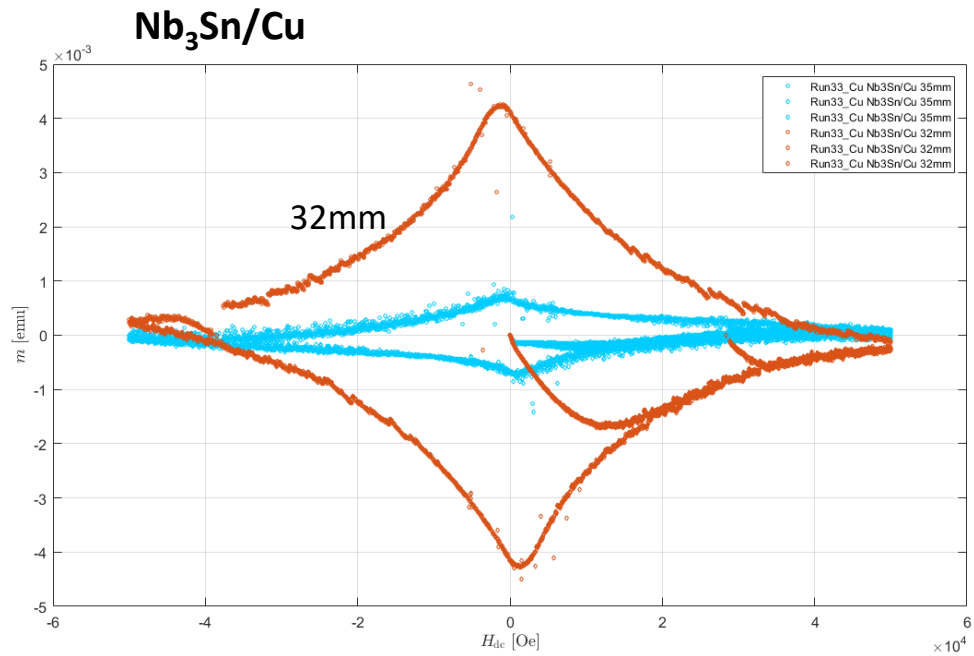


standard - 35mm



recentre - 32mm





Nb₃Sn/Sapphire