analysis_memo

BL05 data structure

summary of important measurements

Direct measurement

run #	SF	I_LV(A)	B_kita(mT)	comments
20210714184125	OFF	1.97	-8.01302	probably I=1.97A, SF:OFF
20210714193654	OFF	1.97	-8.01302	probably I=1.97A, SF:OFF
20210717040703	OFF	2.0	-8.13014	recorded after the sample c was taken out

Characterization of AFP-SF/measurement of beam polarization

These measurements were done with two mirrors (m1 and m2)

The common settings of the AFP-SF

- The DC current/voltage of the AFP-SF should have been kept unchanged. That is 3.270 V / 1.329 A (from photograph taken after the last day). The note on p. 50 of the logbook says 3.259 V / 1.33 A. So there might have been small fluctuations, but should be stable at 1 mA order.
- I could not find the frequency set on the RF coil of the AFP-SF. The resonance frequnecy of the circuit was 103.6 kHz. So the value close to that should hav been used (TH on 2021-08-21)

Relation of current and voltage of the RF coil

Characterization measruement recorded on p.37 of the logbook

V_set (mV)	I_monitor (A)
100	0.3605
150	0.4913
500	1.380
800	2.13832
600	1.63504
760	2.03701
1000	2.64813

List of measurements with AFP-SF OFF (the last part of beam alignment)

run #	theta_m2 (deg)	x_m2(mm)	comments
20210714181508	276.4	78.0	not explicitly written, but probably at I_LV=1.97A, B=-8.01302 mT
20210714185238	275.7	78.0	not explicitly written, but probably at I_LV=1.97A, B=-8.01302 mT
20210714191741	276.2	78.0	not explicitly written, but probably at I_LV=1.97A, B=-8.01302 mT

List of measurements with AFP-SF ON

run #	theta_m2 (deg)	x_m2(mm)	SF-RF (mV)	I_LV(A)	B_kita(mT)	comments
20210714204714	275.7	78.0	100	1.97	-8.01302	I=1.97A not explicitly written, but probably
20210714205602	275.7	78.0	760	1.97	-8.01302	I=1.97A not explicitly written, but probably
20210714210221	275.7	78.0	1000	1.97	-8.01302	I=1.97A not explicitly written, but probably
20210714211037	275.7	78.0	500	1.97	-8.01302	I=1.97A not explicitly written, but probably
20210714211642	275.7	78.0	300	1.97	-8.01302	I=1.97A not explicitly written, but probably
20210714214337	275.7	78.0	760	0	-0.32198	
20210714215803	276.2	78.0	760	1.97	-8.01302	theta_m2 slightly changed

Manual scans of the sample Fe 30 nm

run #	I_labview (A)	real I(A)	mag B (kitaguchi)	SF ON/OFF	Reflection beam x (mm)
20210715075452	0	-0.0041	-0.32198	off	47.2
20210715081447	0	-0.0041	-0.32198	off	47.09
20210715084835	0.15	0.129145	-0.90759	off	47.04
20210715085349	0.264	0.230411	-1.35266	off	47.2
20210715082606	0.378	0.331677	-1.79772	off	47.2
20210715083711	0.6	0.52888	-2.66443	off	47.2
20210715072653	1.97	1.745851	-8.01302	off	47.18
20210715080233	0	-0.0041	-0.32198	on	47.07
20210715082018	0	-0.0041	-0.32198	on	47.13
20210715085144	0.15	0.129145	-0.90759	on	47.1
20210715085714	0.264	0.230411	-1.35266	on	47.19
20210715083141	0.378	0.331677	-1.79772	on	47.24
20210715084052	0.6	0.52888	-2.66443	on	47.21
20210715073913	1.97	1.745851	-8.01302	on	47.11

Manual scans of the sample Fe 90 nm

run #	L_labview I(A)	real I(A)	H (mT)	SF ON/OFF	Reflection beam x (mm)
20210716230107	0	-0.0041	-0.32198	off	
20210716232122	2	1.7725	-8.13014	off	
20210716233530	2	1.7725	-8.13014	on	
20210717001854	0.37	0.324571	-1.76649	off?	
20210717004515	0	-0.0041	-0.32198	off?	
20210717005023	0	-0.0041	-0.32198	on	
20210717022140	0.265	0.2313	-1.35656	off	
20210717022920	0.265	0.2313	-1.35656	on	

Manual scans of the sample Fe 50 nm

run #	L_labview I(A)	real I(A)	H (mT)	SF ON/OFF	Reflection beam x (mm)
20210717051355	0	-0.0041	-0.32198	ON	
20210717052755	0	-0.0041	-0.32198	OFF	
20210717054725	2	1.7725	-8.13014	OFF	
20210717055945	2	1.7725	-8.13014	ON	

List of automatic scans

Scan name	run #	sample t	I_start (LV, A)	I_end (LV, A)	dI (LV, A)	SF ON/OFF	Comments
	202107161931	47 30 nm	0.15	0.26	0.01	OFF	Manually stopped due to beam trouble?
--	202107162010	56 30 nm	0.15	0.26	0.01	OFF	Cannot identify the scan file, lost by overwriting?
scan20210713_flipper_agilent_scan_1	202107162101	53 30 nm	0.2	0.22	0.005	ON/OFF	Observed the transition between 0.15 and 0.22A
scan20210713_flipper_agilent_scan_long_1	202107162207	36 30 nm	0	2.0	2.0	ON/OFF	
scan20210713_flipper_agilent_scan_rough_1	202107162356	19 90 nm	0.37	0.27	0.01	OFF	Wait: 80 s / kp 2000
scan20210713_flipper_agilent_scan_rough_2	20210717002421	90 nm	0.37	0.47	0.01	OFF	Wait: 80 s / kp 2000, manually stopped during index=9
scan20210713_flipper_agilent_scan_rough_3	20210717011121	90 nm	0.35	0.10	0.05	OFF?	Wait: 40 s / kp 1000
scan20210713_flipper_agilent_scan_fine_1	202107170123	26 90 nm	0.240	0.265	0.005	ON/OFF	The N was 13 (should be an even #), manually stopped? The scan log file lost
scan20210713_flipper_agilent_scan_rough_4	20210717024407	90 nm	0.265	0.325	0.01	OFF?	
scan20210713_flipper_agilent_scan_fine_3	20210717030252	90 nm	0.295	0.325	0.005	ON/OFF	Wait: 240 s / kp 6000
scan20210713_flipper_agilent_scan_rough_5	20210717050342	50 nm	0.19	0.36	0.01	OFF	Wait: 20 s / kp 500
scan20210713_flipper_agilent_scan_rough_6	202107170540	10 50 nm	0.23	0.262	0.002	OFF	Creation time of the scan file is 05:21. Due to the beam stop? Wait: 20 s/kp 500
scan20210713_flipper_agilent_scan_fine_5	20210717061701	50 nm	0.23	0.25	0.002	ON/OFF	Manually stopped at 07:25

Scan export

- Use this command to export individual root file from scan root file. The resultant root files are saved under data_scans/

  sh codes/cut_scans/run_makeelist_TH.sh

- The scan log fie used for exporting is listed in the table below (also written in the bash script)

Fe thickness	Scan log	Run#	Comment
30 nm	scan20210713_flipper_agilent_scan_1	20210716210153	
30 nm	scan20210713_flipper_agilent_scan_long_1	20210716220736	
50 nm	scan20210713_flipper_agilent_scan_fine_5_mod	20210717061701	The first end was missing -> complemented. The last start was removed
90 nm	scan20210713_flipper_agilent_scan_fine_3	20210717030252	