TELBE beamtime: 15.06.2018 day shift

Notebook:	Old TELBE Notebook (1)		
Created:	15.06.2018 07:41	**Updated:**	09.08.2018 13:11
Author:	telbe		

MG:

summary of the night shift:
- BSCO measurements (fluence, temperature and polarization dependence finished)
-> THG signal much smaller than in LSCO
-> needed further reduction of intensitz in ZnTe to avoid 3rd harmonic artefact at 10-4 level
fluence measurement -> done with 2.1 and 1,93 THz BP in detection
temperature measurement -> done with 2.1 THz BP in detection
polarization measurement -> done with onlzy 2.1 THz BP in detection

7:00 warm up cryostate and change over to DyBCO sample
8:30 pump down the sample
Before we did anything, there was only one 0.7 THz filter before the sample.
8:57 Re-calibrate polarizer 1

We added the 2nd 0.7 THz BPF which decreases the transmitted power to 74% for all polarizations (We measured several angles*(210/65, 170/49, 210/49) and other angles are calculated to decrease to 74% of each power)

*(P1/P2)

-calibrate for angle dependence

polarizer1 (deg)	**poalrizer2 (deg)**	**THz power (mW)**
205 ***->205***	49	7,48***->10.4 (only 1st 0.7THz BPF)->7.8 (2nd 0.7THz BPF)***
209,5 ***->209***	59	7,46***->10.15->7.8 (2nd 0.7THz BPF)***
212 ***->210***	65	6,74***->10.3->7.8 (2nd 0.7THz BPF)***
214 ***->212***	71.5***->71***	6,61***->10.25->7.8 (2nd 0.7THz BPF)***
216 ***->213.5***	78	6,4***->10.5->7.8 (2nd 0.7THz BPF)***
217 ***->214.5***	82	6,38***->10.36->7.8 (2nd 0.7THz BPF)***
219 ***->216.5***	94	6,37***->10.2->7.8 (2nd 0.7THz BPF)***

-calibrate for fluence dependence

polarizer1 (deg)	**poalrizer2 (deg)**	**THz power (mW)**
205	49	10.35 (only 1st 0.7THz BPF)***->7.66 (2nd 0.7THz BPF)***
200	49	14.0***>10.36 (2nd 0.7THz BPF)***
190	49	21.9***>16.21 (2nd 0.7THz BPF)***
180	49	30.0***>22.2 (2nd 0.7THz BPF)***
170	49	37.0***->27.0 (2nd 0.7THz BPF)***
150	49	38.8***>28.71 (2nd 0.7THz BPF)***
210	49	7.25***->5.34 (2nd 0.7THz BPF)***
215	49	4.83***>3.57 (2nd 0.7THz BPF)***
220	49	2.8***>2.07 (2nd 0.7THz BPF)***
225	49	1.4***>1.04 (2nd 0.7THz BPF)***
157	49	to be calculated

10:15 start cooling down the sample

The position of
Cryostat in stage: 4.1333mm / along the beam: 15.09mm / vertical: 30.13mm
Checking the leakage of 2.1THz

11:21
BDA power - 105 mW
start 58.5mm, 75 steps, -0,1 mm step size, gain 20
file: 147_0p7THz_no_DyBCO_THG_P1_150_P2_49_P3_180

11:53 **start fluence dependence**
BDA power - 100 mW
polarazier 1 - 157
start 58.5mm, 75 steps, -0,1 mm step size, gain 20
file: 148_0p7THz_DyBCO_THG_P1_157_P2_49_P3_180_70K
sample temperature at the end 70.2K

12:10
BDA power 107 mW
polarazier 1 - 150
start 58.5mm, 75 steps, -0,1 mm step size, gain 20
file: 149_0p7THz_DyBCO_THG_P1_150_P2_49_P3_180_70K
sample temperature at the end 70.3K

12:20
BDA power 102mW
polarazier 1 - 170
start 58.5mm, 75 steps, -0,1 mm step size, gain 20
file: 150_0p7THz_DyBCO_THG_P1_170_P2_49_P3_180_70K
sample temperature at the end 70.3K

12:29
BDA power - 103 mW
polarazier 1 - 190
start 58.5mm, 75 steps, -0,1 mm step size, gain 20
file: 151_0p7THz_DyBCO_THG_P1_190_P2_49_P3_180_70K
sample temperature at the end 70.2K

12:37
BDA power - 104 mW
polarazier 1 - 205
start 58.5mm, 75 steps, -0,1 mm step size, gain 20
file: 152_0p7THz_DyBCO_THG_P1_205_P2_49_P3_180_70K
sample temperature at the end 70.2K

12:47
BDA power - 102 mW
polarazier 1 - 225
start 58.5mm, 75 steps, -0,1 mm step size, gain 20
file: 153_0p7THz_DyBCO_THG_P1_225_P2_49_P3_180_70K
sample temperature at the end 70.2K

12:57
BDA power - 100 mW
repeat

12:58 accelerator dropped out / estimated down time is one hour
14:58 beam is back
BDA power - 100 mW fb, 40 mW BP

- check beamprofile: ~ 0.9 mm

15:10
we have beam in the lab
start characterizing the beam
power after BDA: 102 mW
with one 0.7THz filter: 40 mW

x=20

15:36
-calibrate for fluence dependence
power after BDA: 40 mW (one filter)
power at sample position:
theta 2 = 49 deg
theta 1 :

157 deg 29 mW with two filters
170 26.8
180 22.8
190 15.9
200 9.9
205 7.4
210 5.1
215 3.3
220 1.9
225 0.99

- calibrate for polarizor

theta1	theta2	power with 2 filters
205	49	7.3
208	59	7.4
210	65	7.3
212	71	7.3
213.5	78	7.3
214.5	82	7.3
216	94	7.4
216.5	106	7.4
216.5	110	7.4
216	117	7.3
215	123	7.3
212	129	7.3

power was dropping to 35 mW behind BDA, retuned to 39 mW

204	139	7.3

16:40
checked overlapping at ZnTe position
moved sample into beam

accelerator was unstable during last hour. Observed a drop of power by ca. 10% every half hour and always asked operators to retune.

16:47
started fluence dependent measurements at 14K
theta2 is 49 and theta3 is 180 (fixed)
theta1=157
power after BDA: 103 mW
file: 154_0p7THz_DyBCO_THG_P1_157_P2_49_P3_180_14K

16:55
theta1=170
power after BDA: 105 mW

file: 155_0p7THz_DyBCO_THG_P1_170_P2_49_P3_180_14K

17:03
theta1=180
power after BDA: 105 mW
file: 156_0p7THz_DyBCO_THG_P1_180_P2_49_P3_180_14K

17:13
theta1=190
power after BDA: 105 mW
file: 157_0p7THz_DyBCO_THG_P1_190_P2_49_P3_180_14K

17:20
theta1=200
power after BDA: 102 mW
file: 158_0p7THz_DyBCO_THG_P1_200_P2_49_P3_180_14K

17:26
theta1=205
power after BDA: 102 mW
file: 159_0p7THz_DyBCO_THG_P1_205_P2_49_P3_180_14K

17:33
theta1=210
power after BDA: 102 mW
file: 160_0p7THz_DyBCO_THG_P1_210_P2_49_P3_180_14K

17:41
theta1=215
power after BDA: 103 mW
file: 161_0p7THz_DyBCO_THG_P1_215_P2_49_P3_180_14K

17:48
theta1=220
power after BDA: 101 mW
file: 162_0p7THz_DyBCO_THG_P1_220_P2_49_P3_180_14K

17:58
theta1=225
power after BDA: 99 mW
file: 163_0p7THz_DyBCO_THG_P1_225_P2_49_P3_180_14K

power had dropped to 93 mW after measurement
called control room for optimization

repeat measurement at 170 deg

18:09
theta1=170
power after BDA: 102 mW
file: 164_0p7THz_DyBCO_THG_P1_170_P2_49_P3_180_14K
power after measurement: 109 mW

18:26
according to evaluated data, at high fluence we have power of ~3
so decided to do
temperature dependence at the highest fluence
theta1=157
power after BDA: 107 mW
file: 165_0p7THz_DyBCO_THG_P1_157_P2_49_P3_180_14K

18:35
set temperature to 20K

18:41
power after BDA: 107 mW
file: 166_0p7THz_DyBCO_THG_P1_157_P2_49_P3_180_19p6K

18:46
set temperature to 30K

18:53
power after BDA: 108 mW
file: 167_0p7THz_DyBCO_THG_P1_157_P2_49_P3_180_29p2K

19:00
set temperature to 40K

19:03
power after BDA: 109 mW
file: 168_0p7THz_DyBCO_THG_P1_157_P2_49_P3_180_40K

19:09
set temperature to 50K

19:13
power after BDA: 108 mW
file: 169_0p7THz_DyBCO_THG_P1_157_P2_49_P3_180_51K

19:19
set temperature to 60K

19:23
power after BDA: 104 mW
file: 170_0p7THz_DyBCO_THG_P1_157_P2_49_P3_180_61K

19:30
set temperature to 70K

19:37
power after BDA: 104 mW
file: 171_0p7THz_DyBCO_THG_P1_157_P2_49_P3_180_70K

set temperature to 75K

19:48
power after BDA: 107 mW
file: 172_0p7THz_DyBCO_THG_P1_157_P2_49_P3_180_75p5K

19:55
set temperature to 80K

20:00
power after BDA: 107 mW
file: 173_0p7THz_DyBCO_THG_P1_157_P2_49_P3_180_80K

20:07
set temperature to 85K

20:10
power after BDA: 106 mW
file: 174_0p7THz_DyBCO_THG_P1_157_P2_49_P3_180_85K

20:07
set temperature to 90K

20:21
power after BDA: 106 mW
file: 175_0p7THz_DyBCO_THG_P1_157_P2_49_P3_180_90K

20:27
set temperature to 95K

20:33
power after BDA: 105 mW
file: 176_0p7THz_DyBCO_THG_P1_157_P2_49_P3_180_95K

20:39
set temperature to 100K

20:44
power after BDA: 106 mW
file: 177_0p7THz_DyBCO_THG_P1_157_P2_49_P3_180_100K

20:50
removed the 1.9THz filter after sample
repeat T dep for 5K step
go back to 20K

20:59
power after BDA: 105 mW
file: 178_0p7THz_DyBCO_THG_P1_157_P2_49_P3_180_20K

21:05
go to 25K

21:10
power after BDA: 106 mW
file: 179_0p7THz_DyBCO_THG_P1_157_P2_49_P3_180_24K

21:17
go to 30K

21:20
power after BDA: 105 mW
file: 180_0p7THz_DyBCO_THG_P1_157_P2_49_P3_180_29K

21:25
go to 35K

21:30
power after BDA: 104 mW
file: 181_0p7THz_DyBCO_THG_P1_157_P2_49_P3_180_35K

21:25
go to 40K

21:40
power after BDA: 105 mW
file: 182_0p7THz_DyBCO_THG_P1_157_P2_49_P3_180_40K

21:46
go to 45K

21:48
power after BDA: 105 mW
file: 183_0p7THz_DyBCO_THG_P1_157_P2_49_P3_180_45K

21:55
go to 50K

21:48
power after BDA: 107 mW
file: 184_0p7THz_DyBCO_THG_P1_157_P2_49_P3_180_50p8K