

## TELBE beamtime: 13.06.2018 day shift

**Notebook:** Old TELBE Notebook (1)

**Created:** 13.06.2018 06:44

**Updated:** 13.06.2018 21:57

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**Location:** 51°3'31 N 13°56'54 E

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MG:

### *summary night shift:*

- *fluence dependence (not corrected for pulse instability) shows power 2.8*
- *choose to work with field of 45 kV/cm*
- *temperature dependence is running going from 20 K*
- > *we see clear peak at T2 peak at 30 K*
- > *when normalizing to the fundamental<sup>3</sup> it could be that the temperature dependence has no peaks but just a continuous increase from Tc onwards*

### *instrumental:*

- 1. we removed HWP and replaced by polarizer (agreed upon by Yoshikawa)*
- 2. the 2nd 0.7 THz BP is moved directly in front of cryostat to avoid scattering*
- 3. the 2nd BP after the sample (1.93 THz) is removed as it gave shift of THG against fundamental in time domain*

7:36

### **last hour power is stable**

sample temperature 55,5K

BDA - 108 mW

scan range: 58.5 mm, 85 steps, -0,1 mm step size, polarizer at 190 deg

file: 048\_0p7THz\_LSCO\_2mmZnTe\_55p5K

7:43

change sample temperature to 60K

7:45

sample temperature 60K

BDA - 108 mW

scan range: 58.5 mm, 85 steps, -0,1 mm step size, polarizer at 190 deg

file: 049\_0p7THz\_LSCO\_2mmZnTe\_60K

8:00

power BDA: 102 mW fb (fluctuating between 99 - 102)

sample temperature 65.2K

scan range: 58.5 mm, 85 steps, -0,1 mm step size, polarizer at 190 deg

file: 050\_0p7THz\_LSCO\_2mmZnTe\_65p2K

8:06

sample temperature - 64,4K

set up temperature to 70K

BDA power - 98mW

8:12

sample temperature - 70,5K

BDA power - 97mW

scan range: 58.5 mm, 85 steps, -0,1 mm step size, polarizer at 190 deg

file: 051\_0p7THz\_LSCO\_2mmZnTe\_70p2K **(mistake in file name)**

8:18

BDA power - 94 mW

set up temperature to 80K

8:25

BDA power 90mW

temperature 80K

scan range: 58.5 mm, 85 steps, -0,1 mm step size, polarizer at 190 deg

file: 052\_0p7THz\_LSCO\_2mmZnTe\_80K

8:34

BDA power - 99mW

set up temperature to 100K

8:43

BDA power 107mW

sample temperature 100K

scan range: 58.5 mm, 85 steps, -0,1 mm step size, polarizer at 190 deg

file: 053\_0p7THz\_LSCO\_2mmZnTe\_100K

8:56

BDA power - 108mW

9:21

setup for test measurements:

theta1 = 204

theta2 = 5

theta3 = 225

BDA power - no power

**beam lost**

**timing on scope is fine**

**11:45 we are still waiting for the beam**

**-> one powersupply for the TELBE undulator dropped out and the ELBE technicians now try to fix it**

**12:23 power supply is repaired, they are working on restarting the machine**

13:15

BDA power - 102mW

synchronization re-established

change polarizers

theta1 = 190

theta2 = 50

theta3 = 180

sample temperature is 30K

BDA power - 100mW

file: 054\_0p7THz\_LSCO\_2mmZnTe\_P0\_P0\_30K

**ABORTED**

**some problems with software**

13:45

problem solved - wrong axis was selected

BDA power - 90

file: 055\_0p7THz\_LSCO\_P0\_P0\_30p1K

accelerator was retuned and there was network problems

14:22 beam back in lab  
power BDA: 107 mW  
power BDA (1 x filter): 40.2 mW

repeat measurement with polarizations  
theta 1 = 190  
theta2 = 50  
theta3 = 180

14:35  
operator is tuning

we have beam in lab

sample temperature: 30.1 K  
file: 056\_0p7THz\_LSCO\_P0\_P0\_30p1K

set sample temperature to 24.0 K

14:42  
beam is back  
power BDA: 108.5 mW  
power BDA (1 x filter): 40.7 mW

sample temperature: 24.2 K  
file: 057\_0p7THz\_LSCO\_P0\_P0\_24p2K

power BDA: 111 mW

14:56  
sample temperature: 26 K  
file: 058\_0p7THz\_LSCO\_P0\_P0\_26K

15:09  
sample temperature: 28 K  
power BDA: 111 mW  
file: 059\_0p7THz\_LSCO\_P0\_P0\_28K  
(in the metadata, temperature was wrongly written as 26K)

15:19  
sample temperature: 32.3 K  
power BDA: 110 mW  
file: 060\_0p7THz\_LSCO\_P0\_P0\_32p3K

15:28  
sample temperature: 34.5 K  
power BDA: 110mW  
file: 061\_0p7THz\_LSCO\_P0\_P0\_34p5K  
power BDA: 110 mW

15:34  
go to 30 K  
power BDA: 107 mW fb  
file: 062\_0p7THz\_LSCO\_P0\_P0\_30K

15:46  
polarization dependent measurements at 30K  
theta 1 = 202  
theta2 = 5

**theta3 = 225**

power BDA: 110mW

file: 063\_0p7THz\_LSCO\_P45\_P45\_30K

**no signal detected**

so we changed theta3 by 90 degrees

theta 1 = 202

theta2 = 5

**theta3 = 135 (rotated by 90)**

16:07

power BDA: 113mW

file: 064\_0p7THz\_LSCO\_P45\_P45\_30K

**again no signal detected**

16:30

change back to the setting Nr. 1 of polarization measrmt

power BDA: 107mW

file: 065\_0p7THz\_LSCO\_P0\_P0\_30K

16:42

change polarisor setting to

theta 1 = 202

**theta2 = 95 (rotated by 90 degrees)**

**theta3 = 225 (changed back to the original setting)**

power BDA: 107mW

**file: 066\_0p7THz\_LSCO\_P45\_P45\_30K**

**signals observed**

17:00

theta 1 = 194

theta2 = 60

theta3 = 190

power BDA: 108 mW

file: 067\_0p7THz\_LSCO\_P10\_P10\_30K

17:11

theta 1 = 197

theta2 = 66

theta3 = 196

power BDA: 114 mW

file: 068\_0p7THz\_LSCO\_P16\_P16\_30K

17:21

theta 1 = 199

theta2 = 72.5

theta3 = 202.5

power BDA: 113 mW

file: 069\_0p7THz\_LSCO\_P22p5\_P22p5\_30K

17:30

theta 1 = 201

theta2 = 83

theta3 = 213

power BDA: 110 mW

file: 070\_0p7THz\_LSCO\_P33\_P33\_30K

17:52



repeat for polarization 22.5degrees  
theta 1 = 199  
theta2 = 72.5  
theta3 = 202.5  
power BDA: 110 mW  
file: 071\_0p7THz\_LSCO\_P22p5\_P22p5\_30K

18:12  
repeat for polarization 0degree  
theta 1 = 190  
theta2 = 50  
theta3 = 180  
power BDA: 110 mW  
file: 072\_0p7THz\_LSCO\_P0\_P0\_30K

18:25  
**change sample temperature to 45 K**

repeat polarization-dependent measurements

18:40  
polarization 0degrees:  
theta 1 = 190  
theta2 = 50  
theta3 = 180  
power BDA: 110mW  
file: 073\_0p7THz\_LSCO\_P0\_P0\_45K

18:47  
polarization 10 degrees:  
theta 1 = 194  
theta2 = 60  
theta3 = 190  
power BDA: 108mW  
file: 074\_0p7THz\_LSCO\_P10\_P10\_45K

18:57  
polarization 16 degrees:  
theta 1 = 197  
theta2 = 66  
theta3 = 196  
power BDA: 108 mW  
file: 075\_0p7THz\_LSCO\_P16\_P16\_45K

19:09  
polarization 22.5 degrees:  
theta 1 = 199  
theta2 = 72.5  
theta3 = 202.5  
power BDA: 108 mW  
file: 076\_0p7THz\_LSCO\_P22p5\_P22p5\_45K

19:16  
polarization 33 degrees:  
theta 1 = 201  
theta2 = 83  
theta3 = 213  
power BDA: 110 mW  
file: 077\_0p7THz\_LSCO\_P33\_P33\_45K

19:  
polarization 45 degrees:  
theta 1 = 202  
theta2 = 95  
theta3 = 225  
power BDA: 113 mW  
file: 078\_0p7THz\_LSCO\_P45\_P45\_45K

TELBE seems stable, decided to repeat 30K

20:02  
polarization 45 degrees:  
theta 1 = 202  
theta2 = 95  
theta3 = 225  
power BDA: 108 mW  
file: 079\_0p7THz\_LSCO\_P45\_P45\_30K

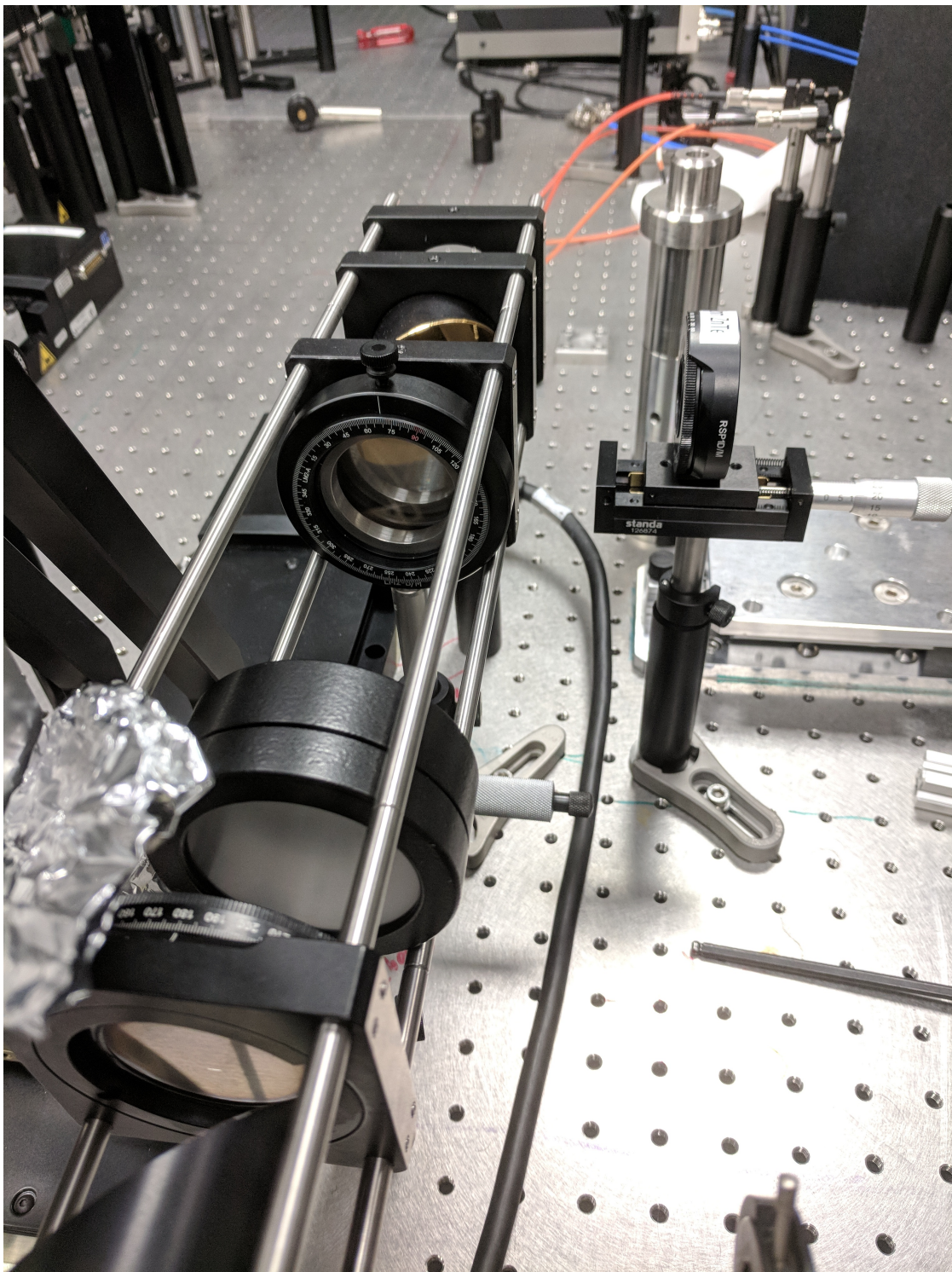
20:13  
polarization 33 degrees:  
theta 1 = 201  
theta2 = 83  
theta3 = 213  
power BDA: 106 mW  
file: 080\_0p7THz\_LSCO\_P33\_P33\_30K

20:20  
polarization 22.5 degrees:  
theta 1 = 199  
theta2 = 72.5  
theta3 = 202.5  
power BDA: 111 mW  
file: 081\_0p7THz\_LSCO\_P22p5\_P22p5\_30K

20:30  
polarization 16 degrees:  
theta 1 = 197  
theta2 = 66  
theta3 = 196  
power BDA: 112 mW  
file: 082\_0p7THz\_LSCO\_P16\_P16\_30K

20:38  
polarization 10 degrees:  
theta 1 = 194  
theta2 = 60  
theta3 = 190  
power BDA: 113 mW  
file: 083\_0p7THz\_LSCO\_P10\_P10\_30K

polarization 0 degrees:  
theta 1 = 190  
theta2 = 50  
theta3 = 180  
power BDA: 112 mW  
file: 084\_0p7THz\_LSCO\_P0\_P0\_30K



21:03  
added one additional polarizer (P3b) between P3 and P4,  
do cross polarization check for 22.5 degrees of polarizer P2  
setting 1:  
 $\theta_1 = 199$   
 $\theta_2 = 72.5$   
 $\theta_3 = 202.5$   
 $\theta_{3b} = 67.5$   
power BDA: 110 mW  
file: 085\_0p7THz\_LSCO\_P22p5\_P22p5\_P3b\_30K

21:12  
setting 2:  
 $\theta_1 = 199$

theta2 = 72.5  
 theta3 = 112.5  
 theta3b = 67.5  
 power BDA: 106 mW  
 file: 086\_0p7THz\_LSCO\_P22p5\_P112p5\_P3b\_30K

