

TELBE beamtime: 14.06.2018 night shift

Notebook: Old TELBE Notebook (1)

Created: 14.06.2018 21:34

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SK:

summary of the day:

fluence dependence for Bi2212 OD50 at 20K

temperature dependence for one 670GHz and two 700GHz filters: 20, 25, and 30K to have cubic dependence regime, power at sample position should be less than 10mW for 0.95mm

MB: FWHM Jitter > 2

21:40

decided to remove the 670GHz filter, in order to keep the same pump beam profile
add 1.9THz filter after sample before ZnTe, in order to reduce fundamental at detection

21:49

set temperature to 20K

power BDA = 106 mW

file:106_0p7THz_BSCO_20K_THG_P1_157_P2_49

power BDA - 106mW, Polarizer 1 to 165deg

Put 155 μ m filter in to increase the sensitivity of THG detection as signal for BSCO is small.

file:107_0p7THz_BSCO_20K_THG_P1_165_P2_49

22:00

power - 107mW, Polarizer 1 to 175deg

start 58.5mm, 75 steps, -0,1 mm step size, gain 20

file:108_0p7THz_BSCO_20K_THG_P1_175_P2_49

22:10

power BDA - 108mW. Polarizer 1 to 185deg

start 58.5mm, 75 steps, -0,1 mm step size, gain 20

file:109_0p7THz_BSCO_20K_THG_P1_185_P2_49

power - 108 mW. polarizer 1 set to 195deg

start 58.5mm, 75 steps, -0,1 mm step size, gain 20

file:110_0p7THz_BSCO_20K_THG_P1_195_P2_49

22:28

power - 107.5 mW. polarizer 1 set to 205deg

start 58.5mm, 75 steps, -0,1 mm step size, gain 20

file:111_0p7THz_BSCO_20K_THG_P1_205_P2_49

22:35

power 109 mW set polarizer 1 to 215deg

start 58.5mm, 75 steps, -0,1 mm step size, gain 20

file:112_0p7THz_BSCO_20K_THG_P1_215_P2_49

22:40 power BDA - 109 mW, polarizer 1 set to 225 deg

start 58.5mm, 75 steps, -0,1 mm step size, gain 20
file:113_0p7THz_BSCO_20K_THG_P1_225_P2_49

22:48 power - 110 mW
polarizer 1 set to 235 deg
start 58.5mm, 75 steps, -0,1 mm step size, gain 20
file:114_0p7THz_BSCO_20K_THG_P1_235_P2_49

22:48 beam was off for sometime. Earlier scan was completed before beam dropped.
asked operators to tune

22:55 got the beam back
power - 107 mW
polarizer 1 set to 220 deg
start 58.5mm, 75 steps, -0,1 mm step size, gain 20
file:115_0p7THz_BSCO_20K_THG_P1_220_P2_49

23:10
power - 111 mW
polarizer 1 set to 210 deg
start 58.5mm, 75 steps, -0,1 mm step size, gain 20
file:116_0p7THz_BSCO_20K_THG_P1_210_P2_49

23:30 Temperature dependence

cool sample to 15K
power - 109 mW
polarizer 1 - 205° , polarizer 2 - 49°, polarizer 3 - 180°, polarizer 4° - allows vertical polarization
start 58.5mm, 75 steps, -0,1 mm step size, gain 20
file:117_0p7THz_BSCO_15K_THG_P1_205_P2_49

23:40 power 108mW
set temperature to 20K
start 58.5mm, 75 steps, -0,1 mm step size, gain 20
file:118_0p7THz_BSCO_20K_THG_P1_205_P2_49

23:50 power 109 mW
set temperature to 25K
start 58.5mm, 75 steps, -0,1 mm step size, gain 20
file:119_0p7THz_BSCO_25K_THG_P1_205_P2_49

00:00
power BDA - 109 mW
set temperature to 30 K
start 58.5mm, 75 steps, -0,1 mm step size, gain 20
file:120_0p7THz_BSCO_30K_THG_P1_205_P2_49

00:08
power BDA - 111 mW
set temperature to 35 K
start 58.5mm, 75 steps, -0,1 mm step size, gain 20
file:121_0p7THz_BSCO_35K_THG_P1_205_P2_49

00:16
power BDA - 108 mW
set temperature to 40 K
start 58.5mm, 75 steps, -0,1 mm step size, gain 20
file:122_0p7THz_BSCO_40K_THG_P1_205_P2_49

00:28
power BDA - 106 mW

set temperature to 45 K
start 58.5mm, 75 steps, -0,1 mm step size, gain 20
file:123_0p7THz_BSCO_45K_THG_P1_205_P2_49

00:36
power BDA - 108 mW
set temperature to 50 K
start 58.5mm, 75 steps, -0,1 mm step size, gain 20
file:124_0p7THz_BSCO_50K_THG_P1_205_P2_49

00:45
power BDA - 110 mW
set temperature to 55 K
start 58.5mm, 75 steps, -0,1 mm step size, gain 20
file:125_0p7THz_BSCO_55K_THG_P1_205_P2_49

00:55
power BDA - 109 mW
set temperature to 60 K
start 58.5mm, 75 steps, -0,1 mm step size, gain 20
file:126_0p7THz_BSCO_60K_THG_P1_205_P2_49

01:00
power BDA - 110 mW
set temperature to 65 K
start 58.5mm, 75 steps, -0,1 mm step size, gain 20
file:127_0p7THz_BSCO_65K_THG_P1_205_P2_49

01:15
power BDA - 111 mW
set temperature to 70 K
start 58.5mm, 75 steps, -0,1 mm step size, gain 20
file:128_0p7THz_BSCO_70K_THG_P1_205_P2_49

01:25
power BDA - 110 mW
set temperature to 80 K
start 58.5mm, 75 steps, -0,1 mm step size, gain 20
file:129_0p7THz_BSCO_80K_THG_P1_205_P2_49

01:40 power BDA - 112 mW
set temperature to 90 K
start 58.5mm, 75 steps, -0,1 mm step size, gain 20
file:130_0p7THz_BSCO_90K_THG_P1_205_P2_49

01:50
power BDA - 110 mW
set temperature to 100 K
start 58.5mm, 75 steps, -0,1 mm step size, gain 20
file:131_0p7THz_BSCO_100K_THG_P1_205_P2_49

02:00 start cooling the sample to 15K

Polarization dependence scans, temperature to 14 K

02:15
polarizer 1 at 205, polarizer 2 at 49, polarizer 3 at 180deg
took 155 micron filter out in order to have more fundamental in signal for calibration
temperature to 14 K
start 58.5mm, 75 steps, -0,1 mm step size, gain 20
file:132_0p7THz_BSCO_14K_THG_P1_205_P2_49_P3_180

02:28
start 58.5mm, 75 steps, -0,1 mm step size, gain 20
file:133_0p7THz_BSCO_14K_THG_P1_209p5_P2_59_P3_190

02:35 power BDA - 111 mW
start 58.5mm, 75 steps, -0,1 mm step size, gain 20
file:134_0p7THz_BSCO_14K_THG_P1_212_P2_65_P3_196

power - 110 mW
start 58.5mm, 75 steps, -0,1 mm step size, gain 20
file:135_0p7THz_BSCO_14K_THG_P1_214_P2_71p5_P3_202p5

02:50
power BDA - 109 mW
start 58.5mm, 75 steps, -0,1 mm step size, gain 20
file:136_0p7THz_BSCO_14K_THG_P1_216_P2_78_P3_209

03:02
power - 109mW
start 58.5mm, 75 steps, -0,1 mm step size, gain 20
file:137_0p7THz_BSCO_14K_THG_P1_217_P2_82_P3_213

03:10
power BDA - 107 mW
start 58.5mm, 75 steps, -0,1 mm step size, gain 20
file:138_0p7THz_BSCO_14K_THG_P1_219_P2_94_P3_225
this scan gave weird looking signal, decided to repeat.

03:35
power - 111 mW
start 58.5mm, 75 steps, -0,1 mm step size, gain 20
file:139_0p7THz_BSCO_14K_THG_P1_219_P2_94_P3_225

rotated P3 to 135deg
repeated above scan
start 58.5mm, 75 steps, -0,1 mm step size, gain 20
file:140_0p7THz_BSCO_14K_THG_P1_219_P2_94_P3_135

04:20 power BDA - 113 mW
added additional polarizer(P5) between 3rd and 4th polarizer,
set the angle of additional polarizer to - 247.5
start 58.5mm, 75 steps, -0,1 mm step size, gain 20
file:141_0p7THz_BSCO_14K_THG_P1_214_P2_71p5_P3_202p5_P5_247p5

04:35 power BDA - 107 mW
start 58.5mm, 75 steps, -0,1 mm step size, gain 20
file:142_0p7THz_BSCO_14K_THG_P1_214_P2_71p5_P3_112p5_P5_247p5

scans 142 and 141 shows weird signal-noise.
Decided to repeat it again.

file:143_0p7THz_BSCO_14K_THG_P1_214_P2_71p5_P3_112p5_P5_247p5

file:144_0p7THz_BSCO_14K_THG_P1_214_P2_71p5_P3_202p5_P5_247p5

file:145_0p7THz_BSCO_14K_THG_P1_214_P2_71p5_P3_202p5_P5_247p5

scan 145 looks okay.

05:30

power BDA - 109 mW

start 58.5mm, 75 steps, -0,1 mm step size, gain 20

file:146_0p7THz_BSCO_14K_THG_P1_214_P2_71p5_P3_112p5_P5_247p5

05:45

power BDA - 109 mW

Z position of cryostat 17.15

moved the cryostat away from THz path

Measuring THz power at sample position for different orientation of the wire grid polarizers for calibration.

polarizer1 (deg) (mW)	poalrizer2 (deg)	THz power
205	49	7,48
209,5	59	7,46
212	65	6,74
214	71.5	6,61
216	78	6,4
217	82	6,38
219	94	6,37

measuring THz power at ZnTe position, removed the filters in path for this measurement.

polarizer 1	polarizer2	polarizer3	THz power (mW)
205	49	180	13,9
209,5	59	190	14,3
212	65	196	12,8
214	71,5	202,5	11,5
216	78	209	10,2
217	82	213	9,4
219	94	225	6,8