Research report
Harsono C. – PD
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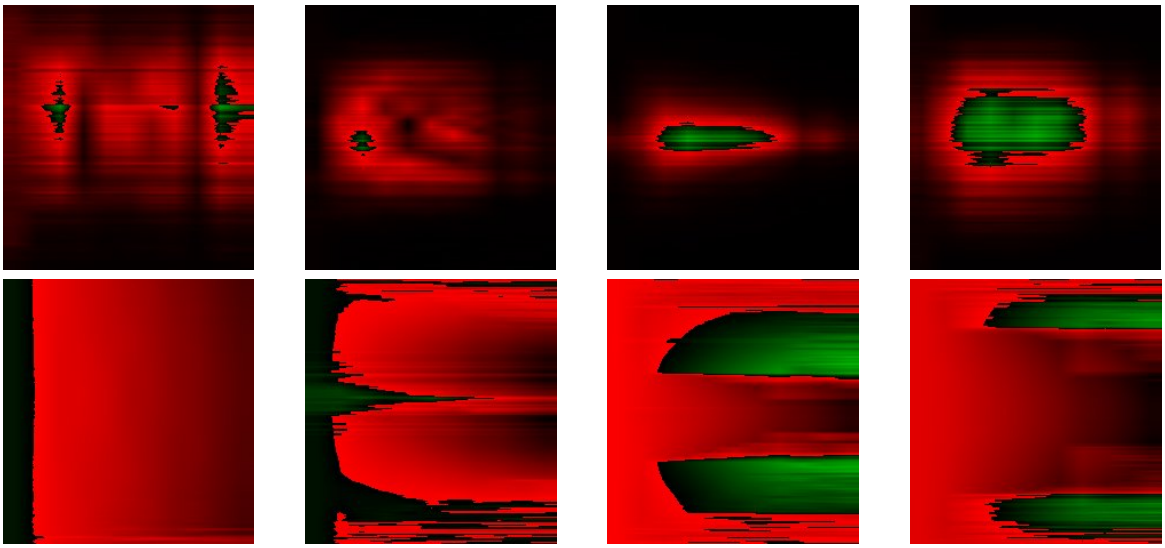
Frequency domain analysis of THz wave

These results were taken under Condition 1 in Table 1 with time window of 6.67 ps within 260 sampling points at 100 ms/frame (equal to spectral resolution of 0.15 THz and spectral range of 38 THz).

Planar wave | 80 mm from ZnTe | 115 mm from ZnTe | 150 mm from ZnTe



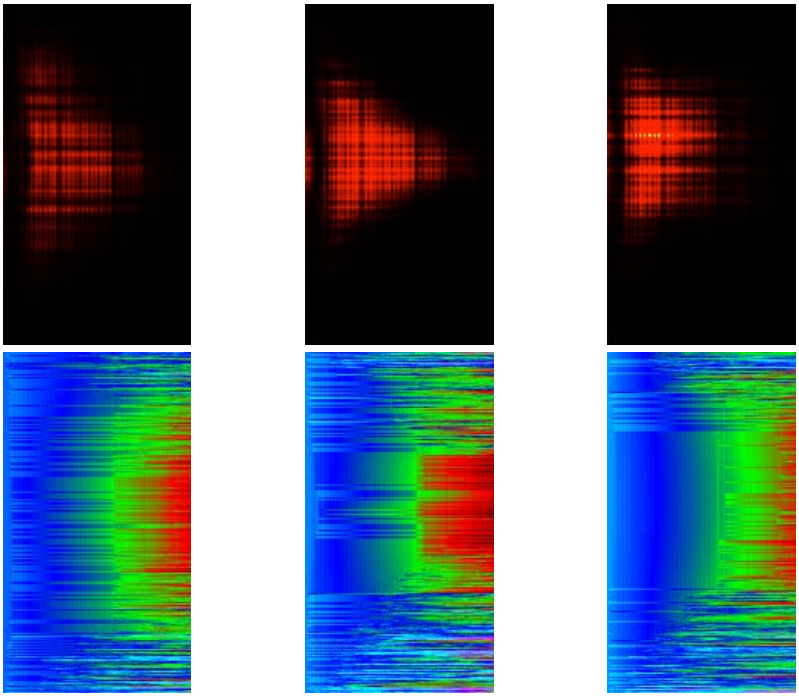
Amplitude

Phase

Frequency domain images (20x scale, 0-1.5 THz) with different lens distances from ZnTe

These results were taken under Condition 2 in Table 1 with time window of 66.67 ps within 260 sampling points at 1000 ms/frame (equal to spectral resolution of 0.015 THz and spectral range of 4 THz). The images in the first group and the second group were taken with and without expansion of THz beam.

80 mm from ZnTe | 115 mm from ZnTe | 150 mm from ZnTe

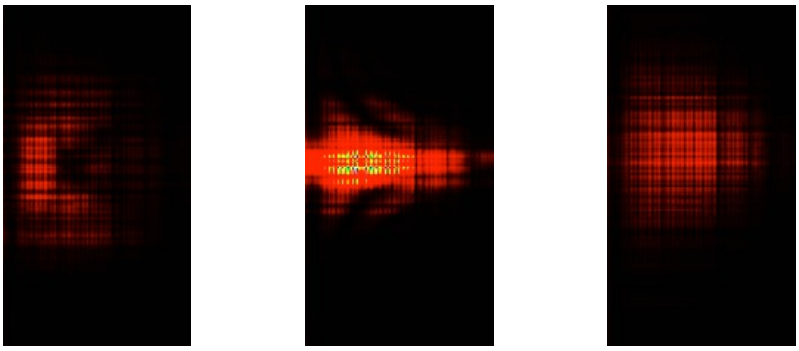


Amplitude (YZ)

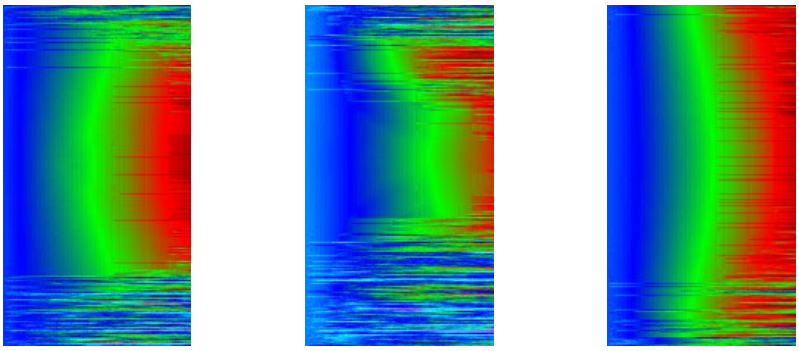
Phase (YZ)

Frequency domain images (no scale, 0-4 THz, expansion) with different lens distances from ZnTe

80 mm from ZnTe 115 mm from ZnTe 150 mm from ZnTe



Amplitude (YZ)



Phase (YZ)

Frequency domain images (no scale, 0-4 THz, no expansion) with different lens distances from ZnTe

This week I could not do any experiment because the changing of the chiller for Hurricane laser. After the change of chiller, the power and pulse width of the laser were 860 mW and 122 fs, respectively. Then, I will take the same data without beam expansion with better setup.

Table 1. Comparison of experiment conditions

Condition 1	Condition 2
S = 1 mm	S = 10 mm
T = 6.67 ps	T = 66.67 ps
ΔF= 0.15 THz	Δf = 0.015 THz
N = 260	N = 260
ΔT = 26 fs	ΔT = 256 fs
F = 38 THz	F = 4 THz
V = 40 pulse/s	V = 40 pulse/s
t total = 26 s	t total = 260 s
t frame = 100 ms	t frame = 1000 ms

Next week, I will move to the adaptive sampling experiment with ASOPS system with Ichikawa-san.