

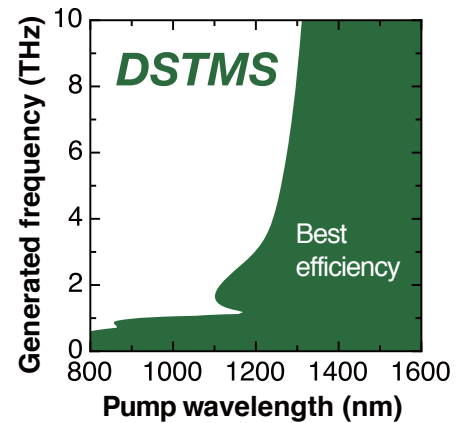
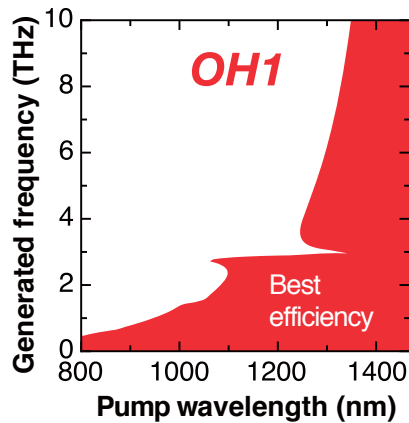
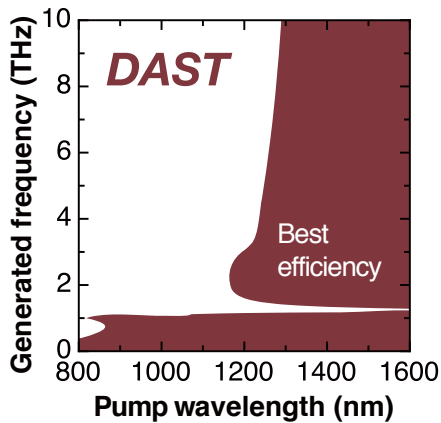
# Terahertz Generator and Detector



- Efficient THz generation using optical rectification of fs pump pulses
- Efficient THz generation using nonlinear optical difference frequency generation
- Optimized for pump wavelengths of 1.2-1.6  $\mu\text{m}$  and 0.7-0.8  $\mu\text{m}$
- Efficient electro-optic THz detector

<b>Specifications</b>	
Aperture	2 to 10 mm
Damage Threshold	250 GW/cm <sup>2</sup> @ 1.5 $\mu\text{m}$ , 150 fs pulse length 300 GW/cm <sup>2</sup> @ 0.8 $\mu\text{m}$ , 70 fs pulse length 300 MW/cm <sup>2</sup> @ 0.5-1.5 $\mu\text{m}$ , 10 ns pulse length
Photon conversion efficiency	$2 \times 10^{-4}$ /MW-peak power

## THz Frequency Ranges for Generator Materials



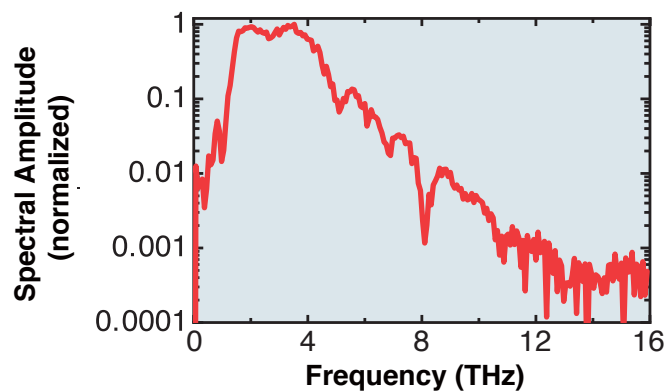
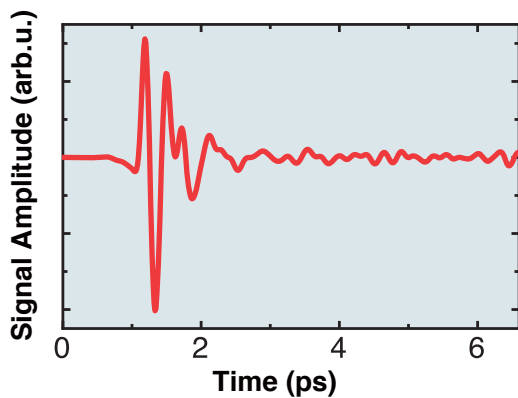
## Spectral Bandwidth (measured with Rainbow Photonics instruments)

Source/Detector: 0.45 mm DSTMS

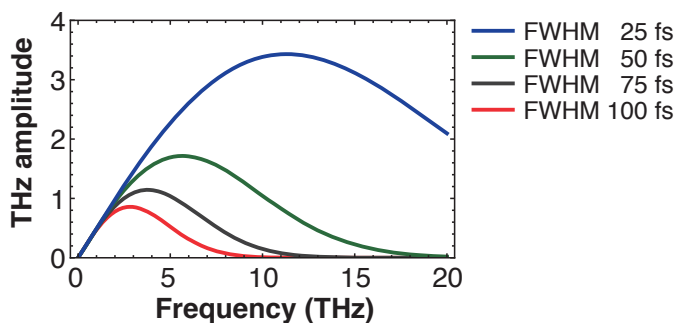
$\lambda = 1560$  nm

Pump Pulse length: 65 fs

Energy/Pulse: 1.8 nJ, Average Power: 180 mW



## THz Frequency Range for Different Pump-Pulse Lengths



## References

- A. Schneider et al, Appl. Phys. Lett. 84, 2229 (2004).
- A. Schneider et al, J. Opt. Soc. Am B 23, 1822 (2006).
- F. Brunner et al, Opt. Express 16, 16496 (2008).
- M. Stillhart et al, J. Opt. Soc. Am B 25, 1914 (2008).

More information available upon request.

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