**Off-axis THz Parametric Oscillator**

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All the previously reported Terahertz (THz) parametric oscillators resonate the signal lasers red-shifted from the pump lasers, suffering from low parametric gain and high absorption loss for the generated THz waves. Here, we report a generic THz parametric oscillator that resonates a THz wave with a zigzag path in a pump-filled monolithic crystal. By pumping such an off-axis lithium-niobate oscillator with a pulsed Nd:YAG laser having an axial-mode spacing matched to the THz oscillator’s mode spacing, we generated an ultra-broad red-shifted frequency comb between 1065 and 1085 nm at the output, which corresponds to a 5-octave-spanning THz-frequency comb in the idler spectrum. We also demonstrated a signal-seeded off-axis THz parametric oscillator, which generates 90-W narrow-line radiation at 2.1 THz and achieved 46% pump depletion with only 4-mJ pump energy in a 460-ps pulse width.



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* Feb. 2007 ~ Jul. 2012, research fellow, National Synchrotron Radiation Research Center
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**Research Interests**

Laser, Quasi-phase-matching nonlinear optics, optical THz radiation, free-electron laser, laser-driven particle acceleration