

333. Title:Noncascading THz-wave parametric oscillator synchronously pumped by mode-locked picosecond Ti:sapphire laser in doubly-resonant external cavity

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Abstract:A noncascading terahertz (THz) wave parametric oscillator synchronously pumped by a mode-locked picosecond Ti:sapphire laser whose average power was less than 1 W was demonstrated with a noncollinear phase-matching MgO:LiNbO<sub>3</sub> crystal in an external enhancement cavity doubly resonant for both pump (780 nm) and signal (781-784 nm) waves. In the external cavity, in which the pump wave enhanced so as to reduce the pumping threshold of parametric processes, the signal wave could also resonate and thus be enhanced simultaneously, resulting in a THz wave output at approximately 0.9 THz as the idler wave. The novel dual enhancement of pump and signal waves reduced the threshold pumping intensity to approximately 50 MW/cm<sup>2</sup>, which was much lower than that of a conventional externally pumped THz wave parametric oscillator with a crystal.