READi Workshop 2014

Research Exchange And Discovery Workshop.

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Efficient generation of terahertz radiation

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Summary

For several applications like terahertz time-resolved spectroscopy and electron acceleration, mJ-level terahertz pulses are required. Optical rectification is a promising method to generate terahertz radiation with high efficiency. By tilting the pulse intensity front of an ultrafast amplified Ti:sapphire laser pulse in a lithium niobate crystal, we achieved an average power of 6.4 μJ from a 6 mJ laser pulse corresponding to a 0.11% energy conversion efficiency. We discuss the linear and nonlinear processes for efficient optical rectification and give an outlook on the highest efficiency achievable.

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Session Classification: Photon Science