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Spatio-temporal beam profiling of pulsed infrared laser sources

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Development of viable infrared lasers relies not only on the power and wavelength generated by the source, but also on the spatial and temporal profile of the output beam. Thermal imaging is of particular interest to researchers working in the field of optically pumped semiconductor analysis as the output from many of these devices falls in the mid-infrared range. While knife edge and other beam profile analysis techniques typically are unable to capture the temporal evolution of beam profiles, real time imaging is employed in this work, using a thermal camera synchronized with a Nd:YAG pump laser via LabVIEW-controlled triggering. Coupling the synchronization with detailed image analysis using IDL, this new methodology is applied to the near-infrared output of an optical parametric oscillator and ultimately will be extended to mid-infrared semiconductor lasers.

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