

High Repetition Rate Pulsed 2-micron Laser Transmitter for CO₂ Measurement

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Under the NASA Laser Risk Reduction Program (LRRP), funded by Earth Science Technology Office (ESTO), an efficient, injection seeded, high repetition rate Tm: fiber laser pumped Ho:YLF laser has been developed and operation between 100 Hz to 10 kHz has been demonstrated. The work is underway to develop an efficient, high-repetition-rate, pulsed, 2-micron, coherent Differential Absorption Lidar (DIAL) / Integrated Path Differential Absorption (IPDA) instrument for measuring the atmospheric CO₂ profiles (DIAL) and column densities (IPDA) from an airborne platform. In DIAL mode, this instrument will provide the first ever range-resolved, high-precision, remote measurements of the CO₂ content of the atmospheric boundary layer (ABL) and lower troposphere.