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## Mid-infrared (IR) tunable optical parametric oscillator (OPO)-based differential absorption LIDAR (DIAL) for the determination of atmospheric traces gases

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All solid state differential absorption LIDAR (DIAL) based on the mid-infrared (IR) tunable optical parametric oscillator (OPO) is presented. The DIAL is for detection of atmospheric pollutants. A commercial Q-switched Nd:YAG laser serves as a pump source of the nonlinear KTP crystal and produced up to 65 mJ of 1.57  $\mu\text{m}$  radiation. The characteristics of the return signal were obtained from different topographical targets. These characteristics were used to calculate the minimum detectable concentration of several atmospheric pollutants such as ozone, methane and ammonia. Most of the gases can be detected below typical background concentrations for the low-polluted atmosphere.

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