

## NARROW LINEWIDTH OPO LIGHT SOURCE FOR PRECISION SPECTROSCOPY

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Precision spectroscopy of fundamental bands of molecules in the mid-infrared (MIR) region is of great interest in applications of trace detection and testing fundamental physics, where high-power and narrow-linewidth MIR lasers are needed. By controlling the phase noise of the signal and pump light of a continuous wave optical parametric oscillator (OPO), we established a broadly tunable MIR light source which has an output power of several hundred milliwatts and a linewidth of a few tens kilohertz. The long term frequency drift of the MIR laser was reduced and calibrated utilizing an optical frequency comb. The performance of the light source was investigated and tested by measuring the saturated absorption spectroscopy of a few molecular transitions at  $3.3\ \mu\text{m}$ .