

DETECTION OF NITRIC OXIDE (NO) AT 5.3 MICRON USING DIFFERENCE-FREQUENCY LASER SPECTROSCOPY

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Nitric oxide, NO is an environmentally and biomedical important trace gas. It has predicted in the 1970's that nitric oxide played a central role in processes that govern the concentration of stratospheric ozone.[1] Recent studies showed that nitric oxide can signal asthmatic conditions, HIV infection, brain and heart activities and smoking habit.

Detection of nitric oxide using laser spectroscopy has been reported by two groups [2, 3]. Here we report a new approach using difference frequency mixing of two solid state pump sources-Ti:Sapphire laser and Nd:Yag laser- in a periodically poled lithium niobate crystal at room temperature. The concentration of NO detected at 5.3 μm is 5.6 ppm with an accuracy of better than 5% (300 ppb). With further improvement of the laser based NO sensor configuration, a precision of <50 ppb may be reached.