

Opto-Electronics Review, 2015, volume 23, issue 1, pp. 30-34

## **A constant intensity technique to improve the performances of devices based on direct absorption spectroscopy**

*Montori, A.; Pas, M. De; Giuntini, M.; Cumis, M. Siciliani De; Viciani, S.; D'Amato, F.*

DOI: <https://doi.org/10.1515/oere-2015-0002>

### Abstract:

Abstract We describe an all-in-fibre apparatus for Constant Intensity Direct Absorption Spectroscopy (CIDAS) for gas concentration measurements which keeps the power of a diode laser constant along the frequency sweep. The reduction of the large variation of the laser power, connected to the frequency scan, enhances the ability of detecting small variations in a background signal, resulting in an increase of the sensitivity with respect to standard direct absorption techniques. Moreover, CIDAS allows for a real-time observation of the absorption signals without any kind of post-detection processing. The apparatus has been tested with carbon dioxide (CO<sub>2</sub>) and methane (CH<sub>4</sub>), around 1.57 and 1.65  $\mu\text{m}$ , respectively.