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Photonic Device for Gas Detection

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We have developed a photonic device for the detection of gases at sub-ppmv levels of concentration using a modified Intra Cavity Absorption Spectroscopy (ICAS) technique [Technique for the detection of trace gases using intracavity fiber laser absorption spectroscopy (IFLAS), G Das - US Patent 9,705,277, 2017]. In the new ICAS technique, the system was operated near the laser threshold condition in order to increase sensitivity. The device can be used for environmental monitoring. The novelty and the working principle of the system, along with some recent experimental results based on both Acetylene (C₂H₂) and Nitrous oxide (N₂O) gases will be presented. The research was financially supported by Natural Sciences and Engineering Research Council of Canada (NSERC), Canada Foundations for Innovations (CFI), Ontario Center of Excellence (OCE) and Nutrien.

Primary authors: Dr DAS, Gautam (Gautam); Mr TREVISNUTTO, Joshua (Lakehead University)

Presenter: Dr DAS, Gautam (Gautam)

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