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Photonic device for the detection of trace gases (G)

Tuesday 12 June 2018 14:30 (15 minutes)

A trace gas detection device has applications in environmental monitoring and healthcare. Authors will present the working principle of a trace gas sensor operating at room temperature, which was developed using the intracavity absorption spectroscopy method. In the system, a gas cell based on hollow core photonic crystal fiber (PCF) was used as an intracavity cell. The experiments were repeated using a multi-pass gas cell and compared with the results from the PCF based gas cell. The laser wavelength was selected by a fiber Bragg grating (FBG) with a peak wavelength close to one of the absorption lines of the gas sample to be detected. The presentation will include results based on the greenhouse gas, nitrous oxide (N2O), and acetylene (C2H2). The effect of off-resonance laser wavelength, response time and the detection limit of the device will be discussed. Finally, authors will present the application of the device for the measurement of N2O flux. The system can be made to operate in the detection of other gases by using a tunable FBG.

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