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Paper: Gas Sensor Based on Photonic Crystal Fibres in the 2v3 and v2 + 2v3 Vibrational Bands of Methane
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Abstracts:

In this work, methane detection is performed on the 2v3 and v2 + 2v3 absorption bands in the Near-Infrared (NIR) wavelength region using an all-fibre optical sensor. Hollowcore photonic bandgap fibres (HC-PBFs) are employed as gas cells due to their compactness, good integrability in optical systems and feasibility of long interaction lengths with gases. Sensing in the 2v3 band of methane is demonstrated to achieve a detection limit one order of magnitude better than that of the v2 + 2v3 band. Finally, the filling time of a HC-PBF is demonstrated to be dependent on the fibre length and geometry.