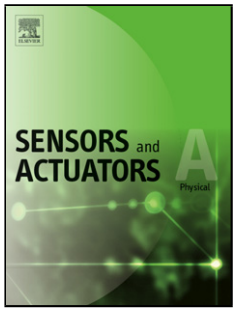

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PII: S0924-4247(17)31663-1
DOI: https://doi.org/10.1016/j.sna.2018.01.001
Reference: SNA 10556

To appear in: *Sensors and Actuators A*

Received date: 15-9-2017
Revised date: 30-12-2017
Accepted date: 2-1-2018

Please cite this article as: Guermat A, Guessoum A, Demagh N-E, Zaboub M, Bouhafs Z, Fibre-optic temperature and pressure sensor based on a deformable concave micro-mirror, *Sensors and Actuators: A Physical* (2010), https://doi.org/10.1016/j.sna.2018.01.001

Fibre-optic temperature and pressure sensor based on a deformable concave micro-mirror

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Highlights

- A fiber optic temperature and pressure sensor is presented
- A micro-cavity etched at the end of an optical fibre is used
- Operating principle is based on a deformable micro-mirror
- Calculations and experimental results are reported
- The operating range of the sensor and its sensitivity are determined

Abstract

This article presents a fibre-optic sensor that measures temperature and pressure. Its operating principle is based on the amplitude modulation caused by the variation in the radius of a concave micro-mirror crafted into the end of an SMF optical fibre. In fact, a micro-cavity engraved into the end of the fibre by selective chemical etching is filled with a PDMS (Polydimethylsiloxane)-type polymer. Due to surface tension, the polymer micro-drop takes on a hemispheric shape characterised by a certain radius. After polymerisation in an oven at