

Institutional Sign In

Browse

My Settings

Get Help

Subscribe

Advertisement

Advertisement

Journals & Magazines > IEEE Transactions on Instrume... > Volume: 65 Issue: 9

# Curvature and Vibration Sensing Based on Core Diameter Mismatch Structures

7 Author(s) Cindy S. Fernandes ; Maria Thereza M. Rocco Giraldi ; Marco J. de So... [View All Authors](#)

8 Paper Citations 253 Full Text Views

Export to Collabratec

## Alerts

Manage Content Alerts Add to Citation Alerts

### More Like This

All Fiber-Optic Sensor for Monitoring Pressure Fluctuations in ON/OFF State IEEE Sensors Journal Published: 2013

Single Modal Interference-Based Fiber-Optic Sensor for Simultaneous Measurement of Curvature and Strain With Dual-Differential Temperature Compensation IEEE Sensors Journal Published: 2018

[View More](#)

### Abstract

#### Document Sections

- I. Introduction
- II. Sensor Fabrication
- III. Experimental Analysis
- IV. Results and Discussion
- V. Conclusion

Authors

Figures

References

Citations

Keywords

Metrics

More Like This

Download PDF

**Abstract:** Core diameter mismatch structures are proposed and experimentally investigated for curvature and vibration sensing. Two configurations are suggested, one approach uses a ... [View more](#)

### Metadata

**Abstract:** Core diameter mismatch structures are proposed and experimentally investigated for curvature and vibration sensing. Two configurations are suggested, one approach uses a structure formed by splicing an uncoated short section of multimode fiber between two standard single-mode fibers (SMFs) single-mode-multimode-single-mode (SMS), combined to a fiber optical mirror at its end, and the other approach uses a structure made by splicing a section of SMF between two multimode fibers (SMSMS). In the curvature analysis, the proposed SMS sensor generates the destructive interference patterns when it is bent, varying only the attenuation of the optical signal without wavelength shifts. The SMSMS vibration sensor proved to be suitable to monitor very low frequencies such as 0.1 Hz. The configuration of the proposed sensors presents several interesting features, such as easy fabrication, low cost, high efficiency, and high sensitivity. These advantages make such sensors very useful in a wide range of applications, for instance, structural health monitoring.

**Published in:** IEEE Transactions on Instrumentation and Measurement ( Volume: 65 , Issue: 9 , Sept. 2016 )

**Page(s):** 2120 - 2128

**INSPEC Accession Number:** 16209047

**Date of Publication:** 06 June 2016

**DOI:** 10.1109/TIM.2016.2571378

**ISSN Information:**

**Publisher:** IEEE

**Sponsored by:** IEEE Instrumentation and Measurement Society

**Funding Agency:**

See the top organizations patenting in technologies mentioned in this article



[Click to Expand](#)

Powered by: Innovation Plus A PATENT SEARCH AND ANALYTICS TOOL

Advertisement

Advertisement


**Contents**
**I. Introduction**

Recent advances and cost reductions in optical devices have stimulated the interest in optical fiber sensors applied to measure the physical and mechanical parameters, mainly because of potential applications in several fields, for instance, structural health monitoring (SHM) [1]-[3]. On this occasion, real-time measurements of strain, curvature, vibration, and other parameters are crucial for identification, localization, and quantification of structural damages, and also improve the maintenance and safety of the monitored structures [4]-[7].

<b>Authors</b>	▼
<b>Figures</b>	▼
<b>References</b>	▼
<b>Citations</b>	▼
<b>Keywords</b>	▼
<b>Metrics</b>	▼

**IEEE Account** ▼**Profile Information** ▼**Purchase Details** ▼**Need Help?** ▼**Other** ▼

A not-for-profit organization, IEEE is the world's largest technical professional organization dedicated to advancing technology for the benefit of humanity.  
© Copyright 2019 IEEE - All rights reserved. Use of this web site signifies your agreement to the terms and conditions.

US & Canada: +1 800 678 4333

Worldwide: +1 732 981 0060

**IEEE Account**

- » Change Username/Password
- » Update Address

**Purchase Details**

- » Payment Options
- » Order History
- » View Purchased Documents

**Profile Information**

- » Communications Preferences
- » Profession and Education
- » Technical Interests

**Need Help?**

- » **US & Canada:** +1 800 678 4333
- » **Worldwide:** +1 732 981 0060
- » Contact & Support

[About IEEE Xplore](#) | [Contact Us](#) | [Help](#) | [Accessibility](#) | [Terms of Use](#) | [Nondiscrimination Policy](#) | [Sitemap](#) | [Privacy & Opting Out of Cookies](#)

A not-for-profit organization, IEEE is the world's largest technical professional organization dedicated to advancing technology for the benefit of humanity.  
© Copyright 2019 IEEE - All rights reserved. Use of this web site signifies your agreement to the terms and conditions.