

## Reviewer 1: Comments and Suggestions for Authors

*The authors thank the Reviewer for the valuable remarks that helped us to improve the quality of the manuscript.*

### Comments and Suggestions for Authors

The review addresses the issue of deploying sensors based on Fiber Bragg Grating (FBG) technology. The review is very well structured and includes many up-to-date sources. As its scientific basis, it mainly uses articles from the Scopus database.

A potential issue in the article is the slightly subjective evaluation of the maturity level to which individual papers are assigned. Unfortunately, it is not clear how this subjectivity could be fully eliminated.

***Response:** The methodology has been clarified to make the classification procedure more explicit. The revised manuscript now states that the classification was based exclusively on explicit evidence reported in the original publications. When the available information was insufficient to justify assignment to a higher maturity level, the study was conservatively classified at the lower level. This clarification makes the classification procedure more transparent and consistent.*

The review would benefit from higher-quality (higher-resolution) figures. It does not contain many new findings but serves as a summary of the applications of FBG technology. If possible, the review could also be extended to include a financial analysis, as economic considerations are one of the main factors influencing whether a technology is implemented in practice or not.

***Response:** All figures have been replaced with higher-resolution versions exported from the original source files to improve readability and image quality. The review was designed to provide a quantitative assessment of deployment maturity across different FBG application domains using a unified classification framework, rather than a descriptive summary of published studies. A brief discussion has also been added in the Conclusion to note that economic factors, including system cost, installation, and maintenance, may also influence the practical deployment of FBG sensing systems and represent an important topic for future studies.*

## Reviewer 2: Comments and Suggestions for Authors

*The authors thank the Reviewer for the constructive remarks and suggestions that helped us to improve the quality of the manuscript. Please find our reply below.*

### Comments and Suggestions for Authors

Upon accepting this review paper, I was genuinely interested to read the findings. As a person doing research in the field of optical fiber Bragg sensors for more than 25 years, I was very keen on seeing the authors' respond to the important question: "is our lab work making an actual impact in the real world?"

I regret to say that although the authors have carried out an extremely well executed and thorough literature search their findings do not answer this question. Research activity differs

greatly form real world adoption. When a technology leaves the lab environment and is adopted by end users the results are very rarely reported in academic journals. It is then in the hands of photonic companies and end users, and the actions/findings of these weren't included in this review. I would expect the manuscript to consider at least patents on the subject or even further, market analysis /white papers. Furthermore, this is true for any technology and it's not limited to optical fiber sensors and FBGs.

Although I see strong merit in this work as a review of recent publication on the field, I don't think the results can actually offer an accurate insight into the Real-World Adoption of FBGs.

With this in mind I am afraid I must reject this publication in its current form and title and encourage the authors to resubmitted adopting a different approach. I see two options: either broad the analysis base beyond journal publications or write the manuscript and conclusions as an assessment of literature-reported field deployment rather than real-world adoption per se.

**Response:** *The reviewer raises an important distinction between real-world adoption and the evidence available in the peer-reviewed scientific literature. We agree that successful industrial implementations are not always documented in academic journals and that patents, industrial reports, and other non-academic sources may provide additional information on technology deployment.*

*The objective of the present review, however, is to assess deployment maturity as documented in the peer-reviewed literature rather than to quantify the overall industrial adoption of FBG sensing technology. To make this scope explicit, the Introduction and Conclusion have been revised to clarify that the proposed framework evaluates the published evidence of deployment maturity and does not imply the absence of successful practical implementations. The revised manuscript now emphasizes that the observed gap reflects the limited availability of peer-reviewed reports describing verified long-term operation under real service conditions, rather than the absence of real-world applications.*

*Accordingly, the manuscript has been revised to consistently present the results as an assessment of literature-reported deployment maturity. The manuscript title, abstract, figure captions, Results, and Conclusions have also been revised to consistently reflect this scope and avoid implying a comprehensive assessment of overall real-world adoption. We believe these revisions clarify the intended scope of the review while preserving its principal contribution, namely providing a systematic and quantitative evaluation of deployment maturity based on evidence reported in the scientific literature.*

Some minor suggestions related to the literature review and presentation:

The current, ongoing year (2026) shouldn't be included in the statistics.

**Response:** *The literature search included all peer-reviewed publications indexed in Scopus up to the literature search date to provide the most up-to-date overview of the field. Consequently, the 2026 records represent a partial year rather than a complete annual record. To avoid potential misinterpretation, this clarification has been added to the Search Strategy, the Dataset Construction and Classification Results section, and the caption of Figure 2.*

Figures 4-8 have merit in scientific publication only if they correspond to actual published manuscripts. The corresponding references should be stated or else the figures should be removed/ adapted.

***Response:** Figures 4–8 were revised to include representative references from published studies. The figures are conceptual syntheses of the key ideas and approaches reported in the cited literature and are intended to provide a clear visual summary of each application domain.*

### **Reviewer 3: Comments and Suggestions for Authors**

*The authors thank the Reviewer for the valuable remarks and suggestions that helped us to improve the quality of the manuscript.*

#### **Comments and Suggestions for Authors**

The work by Alhussein et al. reviewed the lab-to-field transition in FBG sensors: a quantitative assessment of deployment maturity and real-world adoption. This review is very useful for the development of FBG sensors. But there remain some issues to be addressed before I recommend it for the publication as below:

1. Though the authors seek to address some key questions in FBG sensors, there have many reviews related to FBG sensors. So, what is the exact contribution or advance of this work different from others?

***Response:** The present review provides a unified assessment of the deployment maturity of FBG sensing systems, based on evidence reported in the scientific literature, across multiple application domains. Unlike previous reviews, which primarily focus on sensor technologies, sensing principles, or application-specific developments, this review evaluates the progression of FBG sensing systems from laboratory validation toward practical deployment using a consistent analytical framework. To clarify this distinction, the Introduction has been revised and a new comparison table (Table 1) has been added to summarize representative recent reviews and highlight the scope of the present review.*

2. Which database are used for the construction of your dataset? Have you considered the language influence for the dataset construction?

***Response:** The dataset was constructed using the Scopus database. Scopus was selected because of its broad coverage of peer-reviewed scientific literature and its suitability for systematic review and bibliometric analyses. To ensure consistency during the screening and comparative analysis, the literature search was limited to publications written in English. These details have been added to the Materials and Methods section.*

3. What are the quantitatively parameters used to judge the criteria for each level, where current description is qualitative in lines 114-118? Especially, Table 2 gives some 2-4 and 2-3 level cases. So how to count these in your study, which should be clear in the review?

***Response:** The methodology has been revised to clarify the deployment maturity classification procedure. A hierarchical decision process based on five evaluation criteria (testing environment, validation type, field evidence, experimental duration, and system integration) has been explicitly described, together with the criteria used to assign each study to a single deployment maturity level. In addition, the interpretation of the deployment maturity values reported in the synthesis tables has been clarified. These values indicate the maturity level or maturity range at which the corresponding deployment barriers were*

*identified across the reviewed literature within each application domain. They summarize domain-level evidence and are not used to classify individual studies.*

4. shows the distribution of the FBG publications overall. But it is better and useful to generate a map to demonstrate the maturity difference and development stage for each country in the related technology.

**Response:** *We carefully considered this suggestion. However, deployment maturity in the present review was evaluated at the study level rather than the country level. Since publications from the same country span multiple application domains and maturity levels, assigning a single maturity level to a country could oversimplify the available evidence and lead to misleading interpretations. Therefore, the country-level analysis was retained to illustrate global research activity.*

5. The categories mainly based on the application field. In fact, how about the material and structure related for these sensors, which could greatly influence their application fields?

**Response:** *The manuscript has been revised to clarify the rationale for the application-based classification. Since the objective of this review is to evaluate deployment maturity, the reviewed studies were categorized according to their primary application domain. Material selection and sensor structure were considered within each application domain whenever they influenced sensing performance or practical deployment, rather than being treated as separate classification categories.*

6. It is better to introduce the top and bottom limit for each of the investigated FBG sensors in all Tables.

**Response:** *We carefully considered this suggestion. However, the objective of the present review is to evaluate the deployment maturity and practical barriers affecting the transition of FBG sensing systems from laboratory validation to real-world deployment, rather than to compare their measurement performance or operating ranges. Since each application category includes multiple sensing configurations with substantially different measurement limits, introducing upper and lower measurement ranges into the summary tables would not provide a consistent basis for comparison and would shift the focus away from the objective of this review. Representative measurement ranges and sensing performance are discussed in the text where they are directly relevant to the corresponding application, but they were not included as tabulated comparison criteria because they are not the basis of the deployment maturity assessment.*