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| Book Name: | **Plasmas Afterglows with N2 for Surface Treatments synthesis 2024** |
| Manuscript Number: | **Ms\_BPR\_3686.21** |
| Title of the Manuscript: | **Effect of the HF Wave Frequency in the N-atom Production in N2 HF Plasmas. Application to CN Thin Films Deposition** |
| Type of the Article | **Book chapter** |

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| PART 1: Review Comments | | |
| Compulsory REVISION comments | Reviewer’s comment | Author’s Feedback *(Please correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)* |
| **Please write a few sentences regarding the importance of this manuscript for the scientific community. Why do you like (or dislike) this manuscript? A minimum of 3-4 sentences may be required for this part.** | This manuscript is important for the scientific community because it provides a detailed and systematic study of nitrogen atom density in surface-wave nitrogen plasmas and its dependence on various plasma parameters such as wave frequency, absorbed power, and gas pressure. The integration of multiple diagnostic methods, including optical emission spectroscopy and NO titration, enhances the reliability of the results, making it a valuable contribution to the field of plasma chemistry. I appreciate the manuscript for its clear demonstration of how plasma conditions influence nitrogen atom production and for linking these findings to practical applications in thin film deposition. Additionally, the investigation of nitrogen incorporation into CNx films offers important insights for material science, especially for the design of nitrogen-doped carbon materials. However, the manuscript could be further improved by expanding on the mechanistic aspects of nitrogen incorporation and its impact on film properties. |  |
| **Is the title of the article suitable?**  **(If not please suggest an alternative title)** | **Yes** |  |
| Is the abstract of the article comprehensive? Do you suggest the addition (or deletion) of some points in this section? Please write your suggestions here. | **Yes** |  |
| **Are subsections and structure of the manuscript appropriate?** | **Yes** |  |
| **Please write a few sentences regarding the scientific correctness of this manuscript. Why do you think that this manuscript is scientifically robust and technically sound? A minimum of 3-4 sentences may be required for this part.** | This manuscript is scientifically robust and technically sound due to its comprehensive experimental design and the use of well-established diagnostic techniques to measure nitrogen atom density in surface-wave plasmas. The validation of the optical emission spectroscopy method using NO titration ensures the accuracy and reliability of the results, which strengthens the overall scientific correctness of the study. The correlation of nitrogen atom density with plasma parameters such as absorbed power, frequency, and pressure is well-supported by the data, providing a clear understanding of how these factors influence nitrogen production. Furthermore, the study's application of these findings to enhance nitrogen incorporation into CNx thin films demonstrates a careful and methodologically sound approach to both fundamental research and practical applications. The manuscript's thorough data analysis and integration of multiple plasma diagnostics confirm its technical rigor and scientific reliability. |  |
| **Are the references sufficient and recent? If you have suggestions of additional references, please mention them in the review form.**  **-** | **Yes** |  |
| Minor REVISION commentsIs the language/English quality of the article suitable for scholarly communications? | Yes |  |
| Optional/General comments | This manuscript provides valuable insights into the production of nitrogen atoms in surface-wave nitrogen plasmas and their application in CNx thin film deposition. The use of reliable diagnostic techniques and the clear correlation between plasma parameters and nitrogen atom density make the study scientifically robust. The manuscript effectively bridges fundamental plasma chemistry with practical applications in material science, although further exploration of the nitrogen incorporation mechanisms in films would be beneficial. |  |

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| **PART 2:** | | |
|  | **Reviewer’s comment** | **Author’s comment *(if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)*** |
| **Are there ethical issues in this manuscript?** | ***(If yes, Kindly please write down the ethical issues here in details)*** |  |

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| **Reviewer Details:** | |
| **Name:** | **Anitha Rexalin Devaraj** |
| **Department, University & Country** | **AMET Deemed to be University, India** |