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| Book Name: | **Proceedings of the 8th International Conference on Solidification and Gravity** |
| Manuscript Number: | **Ms\_BPR\_3590.6** |
| Title of the Manuscript:  | **Phase-field simulation of SEEDs as nucleation sites in Ti-6Al-4V for electrostatic levitation experiments** |
| 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 significant for the scientific community as it presents a detailed phase-field simulation study of grain refinement in Ti-6Al-4V alloys containing TiC particles. This research is particularly valuable for its application in electrostatic levitation (ESL) experiments and its potential implications for additive manufacturing processes. The strength of this study lies in its comprehensive approach, which combines experimental data with computational modeling to understand the nucleation behavior and grain refinement mechanisms.****The manuscript is commendable for its thorough investigation of the conditions under which SEEDs (precursors of crystal nuclei) act as nucleation sites. By exploring various SEED size distributions and interfacial mobilities, the authors provided insights into the complex interplay between undercooling, nucleation, and grain growth. The findings on the optimal SEED radius range for matching experimental results are particularly noteworthy and could have practical implications for alloy design and processing.**  |  |
| **Is the title of the article suitable?****(If not please suggest an alternative title)** | **The title "Phase-field simulation of SEEDs as nucleation sites in Ti-6Al-4V for electrostatic levitation experiments" appears suitable for the content described in the input text.** |  |
| 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. | **Consider adding a brief note on the limitations of the study or areas for future research.****Consider mentioning the cooling rate used in the simulation, as it's an important parameter in the study.** |  |
| **Are subsections and structure of the manuscript appropriate?** | **The manuscript appears to have an appropriate structure and subsections for a scientific paper. However Adding a "Future Work" or "Recommendations" subsection in the Conclusions is recommended** |  |
| **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.** | * **The study employs advanced computational methods, specifically phase-field simulations, to model and analyze the complex process of grain refinement in Ti-6Al-4V alloys.**
* **The researchers have carefully considered various parameters and conditions to replicate experimental results from electrostatic levitation experiments, demonstrating a thorough approach to validating their model.**
* **The manuscript provides detailed explanations of the simulation setup, including the physical properties used, calculation methods, and definitions of key parameters, which enhances the reproducibility of the study.**
* **Furthermore, the authors critically discuss their findings, comparing simulation results with experimental data and offering insights into the mechanisms of nucleation and grain growth, which strengthens the scientific validity of their conclusions.**
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| **Are the references sufficient and recent? If you have suggestions of additional references, please mention them in the review form.****-** | **The references include a mix of journal articles, conference proceedings, and book chapters from reputable sources in materials science and engineering.** |  |
| Minor REVISION commentsIs the language/English quality of the article suitable for scholarly communications? | **It would be advisable to have a native English speaker or professional editor review the text to enhance its clarity, coherence, and overall readability.**  |  |
| Optional/General comments |  |  |

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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: | **Purushottam Balaso Pawar** |
| Department, University & Country | **SVPM’s Institute of Technology and Engineering, India** |