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| Book Name: | **Proceedings of the 8th International Conference on Solidification and Gravity** |
| Manuscript Number: | **Ms\_BPR\_3590.2** |
| Title of the Manuscript: | **Consideration of the timing effect of dendrite pinch-off on dendrite fragmentation during directional solidification of superalloys** |
| 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 addresses the critical issue of dendrite fragmentation in single-crystal superalloys, which is significant for aerospace and power generation industries. By introducing the timing effect of dendrite pinch-off in a flow-driven fragmentation model, it provides a more accurate prediction of freckles and segregation channels during directional solidification. The study is valuable for the scientific community as it bridges the gap between theoretical modeling and practical control, offering a refined approach that aligns simulation results more closely with experimental observations. I appreciate this manuscript for its clear methodology, relevance to industrial applications, and potential to improve defect prediction in high-temperature materials.** |  |
| **Is the title of the article suitable?**  **(If not please suggest an alternative title)** | **Yes, the title "Consideration of the timing effect of dendrite pinch-off on dendrite fragmentation during directional solidification of superalloys" is suitable. It accurately reflects the key focus of the study on the timing effect of dendrite pinch-off and its influence on fragmentation during the solidification process. This title is clear and effectively conveys the manuscript's specific focus within the broader field of superalloy solidification studies.**  **No alternative title is necessary, as the current one is well-suited to the content.** |  |
| 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. | **The abstract is comprehensive, providing a clear overview of the study's purpose, methodology, and key findings. It effectively introduces the importance of single-crystal superalloys, the problem of freckle formation, and the proposed modification to the flow-driven fragmentation model by incorporating the timing effect of dendrite pinch-off.** |  |
| **Are subsections and structure of the manuscript appropriate?** | **Yes, the subsections and structure of the manuscript are appropriate. The paper is logically organized, moving from an introduction that provides background and significance to a well-defined methodology section that explains the experimental setup and modeling approach. This is followed by detailed sections on simulation results and discussions, which include specific analyses on solidification, dendrite fragmentation, and the impact of the timing effect. Finally, the conclusion effectively summarizes the findings and implications.** |  |
| **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 demonstrates scientific robustness through its rigorous approach to modeling dendrite fragmentation, incorporating both established theories and novel modifications to improve prediction accuracy. The inclusion of the timing effect for dendrite pinch-off adds a critical layer to the fragmentation model, aligning the simulation results more closely with experimental observations. The methodology is technically sound, with detailed explanations of experimental setups, material properties, and numerical modeling parameters, indicating careful consideration of variables that impact solidification and freckle formation. Additionally, the manuscript references and builds on previous studies, showing a strong grounding in existing literature while contributing meaningful advancements to the field.** |  |
| **Are the references sufficient and recent? If you have suggestions of additional references, please mention them in the review form.**  **-** | **The manuscript's references are generally sufficient and recent, supporting its scientific context and findings effectively. However, adding the following references would strengthen the discussion by providing additional insights into the mechanical properties of alloys and the effects of alloying elements on tensile stress and elongation:**   1. https://dx.doi.org/10.20319/mijst.2018.41.162179 2. Investigation of Tensile Stress and Percentage Elongation Relationships in Alloys Depending on the Alloy Elements, pp. 123-133 ([link](https://img1.wsimg.com/blobby/go/58055720-afae-4264-9bc9-d6071e8466f6/downloads/3ceacda2-94cc-4bc4-a0b8-373d9cfa2a33/Makine%20M%C3%BChendisli%C4%9Fi.pdf?ver=1729619668643)) 3. https://doi.org/10.1007/s12613-021-2331-1   **Incorporating these references would enrich the manuscript by providing a broader foundation for understanding the relationship between alloy composition and mechanical behavior.** |  |
| Minor REVISION commentsIs the language/English quality of the article suitable for scholarly communications? | **Yes, the language and English quality of the article are suitable for scholarly communication. The manuscript is well-written, with technical terminology used accurately and effectively, which is essential for clarity in scientific discourse. The sentences are generally well-structured, and the explanations are clear, aiding comprehension of complex concepts. Overall, the language quality meets the standards expected in scholarly publications, and no significant revisions are necessary in this regard.** |  |
| Optional/General comments | **The research is well-executed and valuable for the scientific community, particularly for its innovative approach to modeling dendrite fragmentation in superalloys. The manuscript’s language, structure, and scientific rigor are of high quality, but there are minor suggestions for improvement in the abstract and references that would enhance the overall clarity and comprehensiveness. These adjustments are minor and do not detract from the manuscript's scientific contribution.**  **There are no ethical issues apparent in this manuscript. The study focuses on computational modeling and experimental analysis within the field of materials science, and no human or animal subjects are involved. Additionally, the research appears to be conducted and reported transparently, with appropriate citations to prior work. Therefore, it meets the ethical standards typically required for publication in this field.** |  |

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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: | **Can Gonenli** |
| Department, University & Country | **Ege University, Turkey** |