

Dear Editor,

We appreciate the clear language of Anonymous Referee #2 and the opportunity to further clarify and revise. Our intention is certainly not to “bash”. Rather, the effort to include Table 1 and Appendix G has been deliberate. It serves to illustrate the relevance of what we present and our careful consideration of existing approaches.

After describing advantages and challenges of differing formulation and solvers, we use this summary of prominent models to demonstrate how our work relates to current simulation practice. A reader without detailed knowledge about solving heat transfer with phase change may otherwise suspect an established way of reliably finding conservative solutions to be ‘somewhere out there’, given the many established models that exist, and the fundamental nature of the problem.

We have now further clarified in the Table caption that identifying theoretical limitations does not imply the models we list are not fit for application. We hope that will satisfy any remaining concerns.

Kind regards,

Niccolò Tubini, on behalf of all authors

List of relevant changes

- Line 73 we changed ‘a semi-implicit’ with ‘an implicit’.
- Line 149 we reformulated the sentence.
- Line 166 we changed ‘a semi-implicit’ with ‘an implicit’.
- Line 168 we added the reference Casulli and Zanolli 2012.
- Lines 171-172 we reformulated the sentence in order to clarify the expression ‘guaranteed convergence’.
- Table 1 we reformulated the caption.
- Table 1 we changed the header of the fifth column from ‘Limitation’ to ‘Theoretical limitation’.
- Table 1 we changed the expression ‘non-convergence problem’ with ‘non-convergence’.
- Table 1 we changed the expression ‘Convergence is not guaranteed’ with ‘Nonlinear solver’.
- Table 1 we change the footnote (g).
- Line 185 we changed ‘a semi-implicit’ with ‘an implicit’.
- Equation (12, 13) we changed Λ_j^n with Λ_j^{n+1}
- Line 426 we reformulated the sentence.
- Line 436 we reformulated the sentence.
- Line 464 we reformulated the sentence.
- Line 480 we reformulated the sentence.
- Line 486 we reformulated the sentence.
- Appendix C we changed the name.
- Table E1 we removed the footnote and corrected the initial and the surface temperature values.