

Review of the revised manuscript

The authors have shifted the emphasis from a strong focus on intersection angles to highlighting the broader benefits of introducing a non-normal flow rule. They argue that the plastic potential offers an interesting and useful modeling capability: it allows optimization of deformations while maintaining the same yield curve, and conversely, it permits adjustments of the yield curve to improve simulations of landfast ice and sea-ice drift with little impact on deformation patterns.

Overall, the manuscript has been improved compared to the previous version. The most important criticism, the missing validation of the implementation of the non-normal flow rule, has been convincingly addressed: the supplement now includes a uniaxial compression test (after Ringeisen et al. 2021). Methodological differences from earlier studies (Hutter & Losch 2020; Hutter et al. 2022) are also explained more clearly, and the quantitative analysis provides new insights into the relationship between the computational grid and LKF orientations.

Nevertheless, some issues remain. The central discrepancy, why pan-Arctic simulations continue to produce intersection angles peaking at 90° instead of $\sim 45^\circ$, is acknowledged but not resolved. This limits the general validity of the conclusions. In addition, it is not correct to state that the intersection angles are “partly caused by the alignment of LKFs with the computational grid”; the results demonstrate correlation rather than a proven causal mechanism.

Finally, the manuscript remains highly technical in places. Requests for explanatory sketches or schematics were not implemented; instead, references are made to other papers. This does not resolve the issue, especially when the sections in question concern the authors’ own newly developed methodology in python. It raises the question of why such material is included in the manuscript if, in its current form, it remains difficult for readers to follow. This should clearly be improved before publication. I recommend acceptance after minor revisions

Minor comments (to be addressed before publication):

- 1.20: Please add a citation to “*for example to optimize landfast ice.*”
- 1.14: “*We show that these frequent 90° angles are partly caused by the alignment of LKFs with the computational grid.*” What is shown is rather a correlation, not clearly a causal mechanism.
- 1.93: You are probably referring to the appendix here, please clarify.
- 1.280–288 (Numerical convergence): It would be helpful to test at least one run with substantially more Picard iterations to rule out that insufficient convergence affects the results.
- Fig. 1: The notation “ $i=100, j=100$ ” in the caption is unclear, please explain what i and j stand for.
- p.8, 1.176–190: This section remains very technical. Since it introduces the new analysis tool, the description should be made more accessible to readers. A sketch showing an LKF, grid lines, and the angles under discussion would be very helpful.
- 1.309: Please explain what N_{min} means.
- Fig. 12: Please also include the standard VP model to make the differences visible.
- Appendix A: Please add i/j axes to the figure.
- 1.423–434: A sketch would help illustrate the contour lines under discussion.