MISMIP+ summary

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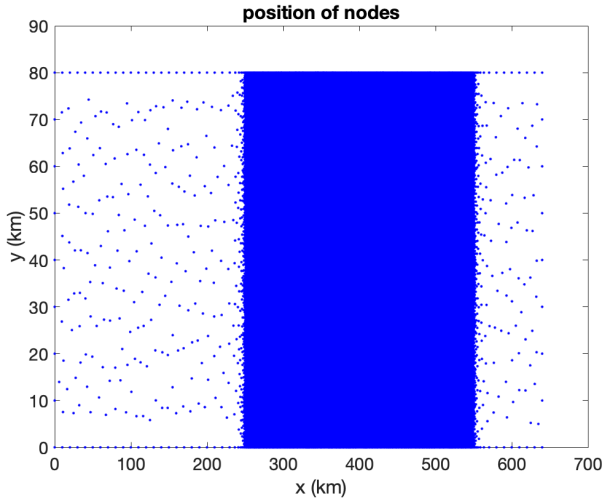
1 Model Details

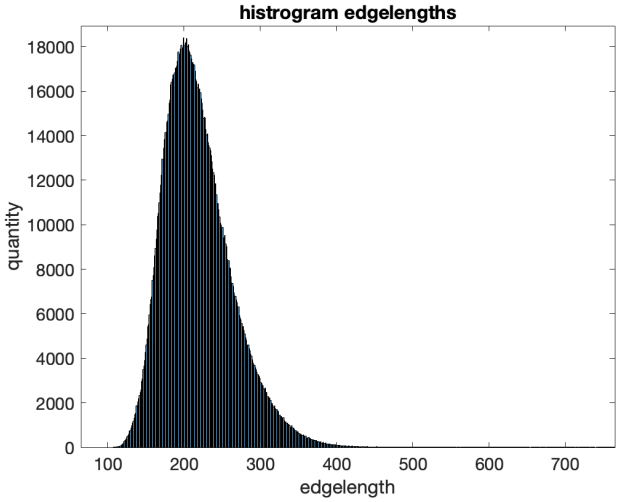
1. model: ISSM ver. 4.16 (svn revison 23648), https://issm.jpl.nasa.gov/
2. repository: https://issm.jpl.nasa.gov/download/
3. englacial stresses: HO, Glen's law with $n = 3$, $A = 2.0 \times 10^{-17} \mathrm{Pa}^{-3} \mathrm{a}^{-1}$
4. basal traction: modified power-law relation introduced by Tsai et al. (2015), see Asay-Davis et al. (2016, Eqns. 7,9,10) with $\alpha^2 = 0.5$, $m = 3$, and $\beta^2 = 3.16 \times 10^6 \mathrm{Pa\,m^{-1/3}\,s^{1/3}} = 10^4 \mathrm{Pa\,m^{-1/3}\,a^{1/3}}$
5. space discretization: finite elements, non-uniform grid with triangles in horizontal direction, 5 vertical layers, fine mesh resolution $\sim 200\,\mathrm{m}$ in the area crucial for the MISMIP+ experiments from $x = 250\,\mathrm{km}$ to $x = 550\,\mathrm{km}$, apart from that $10\,\mathrm{km}$
6. time discretization: fixed time step with $\Delta t = 0.5\,\mathrm{a}$
7. grounding line: subelement migration, the basal friction coefficient is multiplied by the ratio of grounded and total area of each partially grounded element
8. MISMIP3d name: we did not participate with the model ISSM

2 Comments

Spin-up: The initial geometry is developed from a constant thickness of $H = 100\,\mathrm{m}$. A stable state is found after $t = 15\,000\,\mathrm{a}$, which is used as the initial state for the MISMIP+ experiments Ice0, Ice1r, and Ice2r.
Ice1rr: The grounding line position moves out of the refined mesh domain after $t = 571\,\mathrm{a}$ therefore the results for the Ice1rr experiment are only stored until $t = 500\,\mathrm{a}$.

Mesh: The position of the nodes and the histogram of the edgelengths of the refined area are shown in the following two figures:





References

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