

The sentence below [Lines 11-13] may be removed for a better flow in the abstract:

*Furthermore, in single subduction system models, low basal drag, associated with a low ratio of asthenospheric to lithospheric viscosity, leads to subduction behaviour most consistent with the observation that trench migration velocities are generally low compared to convergence velocities.*

The information above may be shortened by adding the red section below on Line 17:

... including low ratios of trench over plate motions **that would be maintained at a high ratio of lithosphere to asthenosphere viscosity.**

(I find going from lithosphere to asthenosphere is easier to grasp, similar to how you did on Line 453)

Lines [297-299] needs rewording.

*We also tested whether a self-consistent rheology that yields a stronger lithosphere and weaker asthenosphere than the reference models behaves similarly as the models where we artificially prescribed regions of modified viscosity.*

The Conclusion looks a bit wordy to me. You may consider shortening it by giving the key ideas in one or two paragraphs at most.

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