



SUBDUCTION INITIATION BY POLARITY REVERSAL

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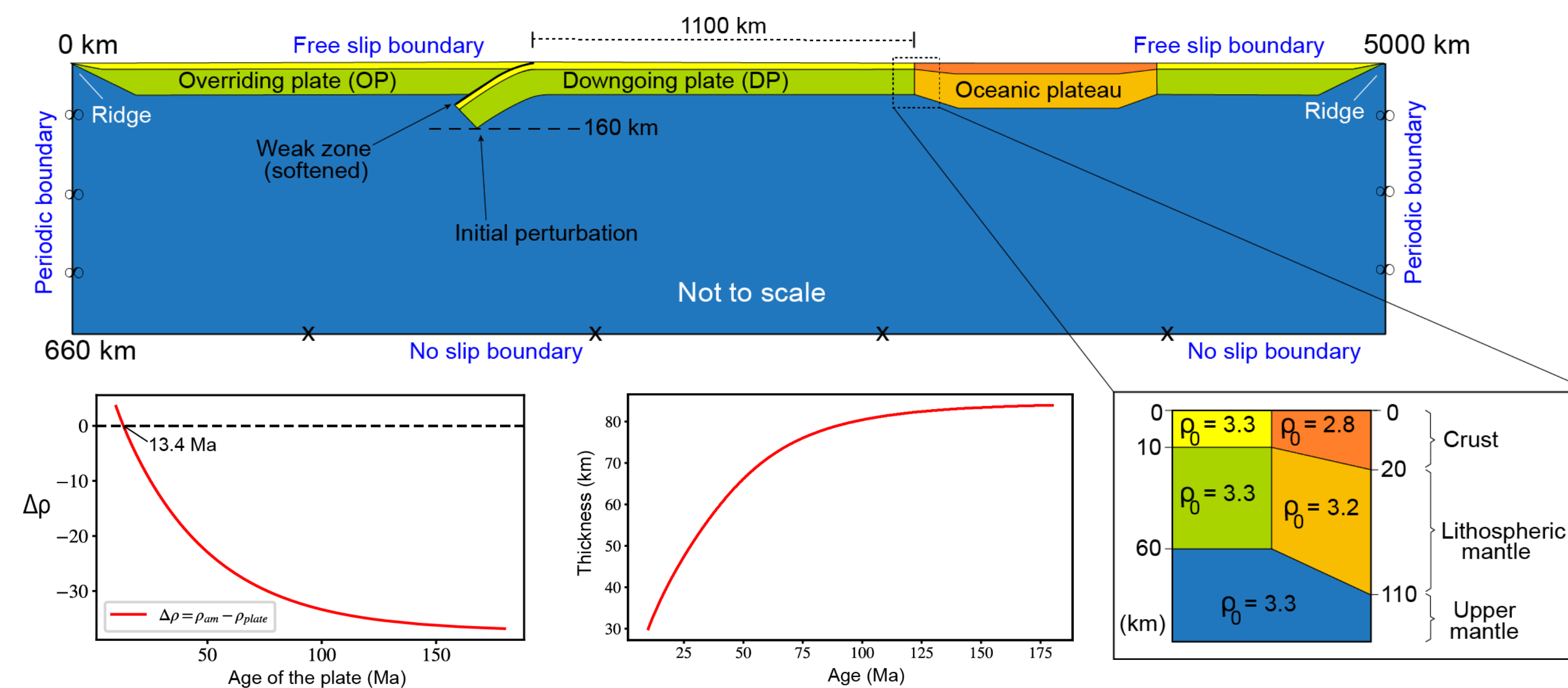
Objectives

- Constrain the dynamics of polarity reversal subduction initiation using self-consistent modelling;
- Systematically test initial plate ages (from 10 to 90 Ma, with 10 Ma intervals) to map domains of stability;
- Identify the critical factors that promote or hinder subduction initiation.

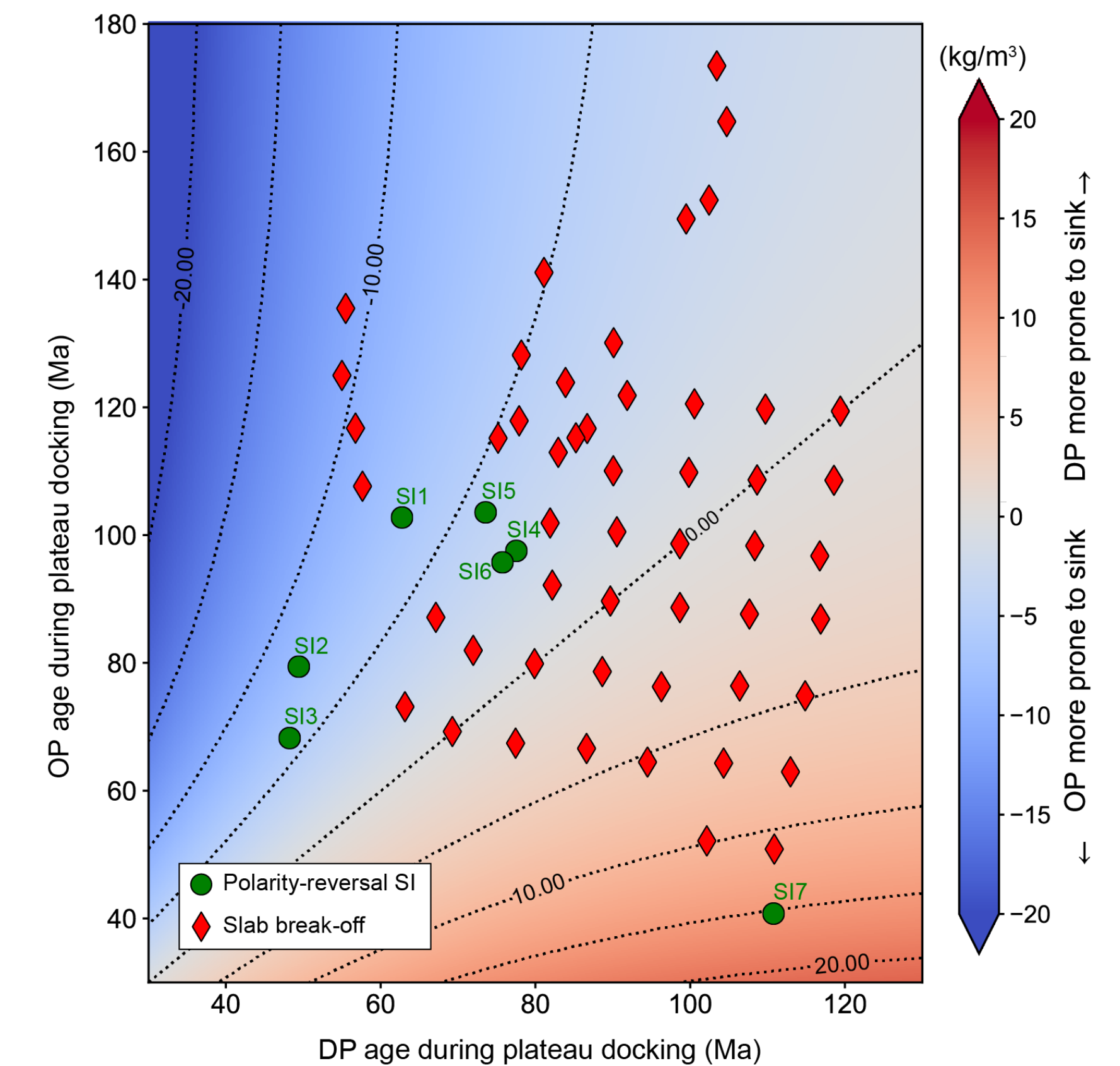
Methods

- All modelling performed using Underworld code;
- Self-consistent conditions;
- Velocities arise as consequences of buoyancy contrasts and viscous shear resistances.

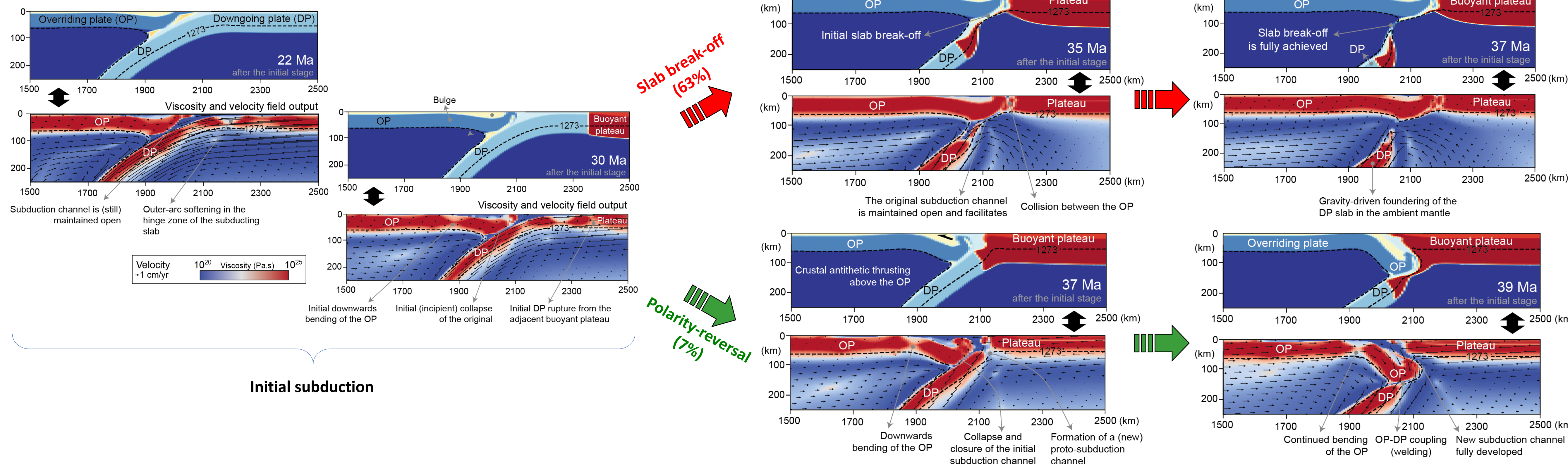
Initial setup



Results - Overall view



Results – Different subduction modes



Conclusions

- Polarity reversal is *geodynamically viable* as a subduction initiation process;
- Does not require unrealistic natural forces to initiate;
- It is achievable for (highly) specific *Goldilocks* conditions:
 - indentation of *relatively younger* and *deformable* overriding plates;
 - folding of *young overriding plates* by *relatively older* downgoing plates