

**Table 2.** List of numerical experiments.

Experiment	Description—variation from reference model
EX1	–reference model
EX2	–wet olivine mantle <sup>1</sup> : $A = 4.89 \times 10^{-15} \text{ Pa}^{-n}/\text{s}$ , $n = 3.5$ , $Q = 515 \text{ kJ/mol}$ in regions 2, 3, 4, 5.
EX3	–dry olivine mantle <sup>1</sup> : $A = 4.85 \times 10^{-17} \text{ Pa}^{-n}/\text{s}$ , $n = 3.5$ , $Q = 535 \text{ kJ/mol}$ in regions 2, 3, 4, 5.
EX4	–increase range of strain for plastic softening: $\epsilon_1=0.5 \rightarrow \epsilon_2 = 5.0$ (for same $\phi_1 = 15^\circ$ and $\phi_2 = 2^\circ$ ).
EX5	–suppress strain softening: set $\phi_1 = 15^\circ$ and $\phi_2 = 15^\circ$ .
EX6	–increase initial geotherm in model (see text).
EX7	–increase crustal thickness to $\sim 40.8 \text{ km}$ .
EX8	–make mantle neutrally buoyant by setting $\alpha = 0$ in all regions.
EX9	–decrease imposed convergence velocity to $v_x = 0.5 \text{ cm/yr}$ .
EX10	–increase imposed convergence velocity to $v_x = 4.5 \text{ cm/yr}$ .

Reference for viscosity parameters: 1. *Hirth and Kohlstedt [1996]*.

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