Supporting Information for "Thermo-mechanical effects of microcontinent collision in ocean-continent subduction system"

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Additional Supporting Information (Files uploaded separately)

1. Captions for Movies S1 to S12

Introduction Here, we present Movies of strain rates, composition and/or velocity fields of some models in order to provide more detailed information on their evolution. In particular, we provide the strain rate evolution of the model without microcontinent, fixed upper plate and velocities of the subducting plat of 1 and 4 $\mathrm{cm\,yr^{-1}}$ (model NM1 in Movie S1 and model NM3 in Movie S2, respectively), tested to verify the effects of the velocity field on the evolution of the models. In addition, to test the effects of different dimensions of the microcontinent located at various distance from the upper plate we also provide Movies with the evolution of either composition and velocity field or strain rates of models:

1. S1 and S9 with 25 km-wide microcontinents (Movies S3 and S4);

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2. M1, M3, M6 and M11 with 50 km-wide microcontinents (Movies S5, S6, S7, S8 and S9);

3. L3 and L4 with 75 km-wide microcontinents (Movies S10 and S11);

4. XL1 with 100 km-wide microcontinent (Movie S12).

Movie S1. Evolution of strain rates for model without microcontinent and velocity of the subducting and the upper plate of 1 and 0 $\mathrm{cm\,yr^{-1}}$, respectively (model NM1). The model shows the development of a subduction channel with high strain rates and low strain rates in the upper plate.

Movie S2. Evolution of strain rate for model without microcontinent and velocity of the subducting and the upper plate of 4 and 0 $\mathrm{cm\,yr^{-1}}$, respectively (model NM3). The model shows the development of a subduction channel with high strain rates and bands characterized by high strain rates in the upper plate.

Movie S3. Evolution of composition and velocity field for model with 25 km-wide microcontinent located 25 km far from the upper plate and velocity of the subducting and the upper plate of 1 and 0 $\mathrm{cm\,yr^{-1}}$, respectively, (model S1). The model shows the recycling of large amount of subducted material derived from the microcontinent.

Movie S4. Evolution of composition and velocity field for model with 25 km-wide microcontinent located 100 km far from the upper plate and velocity of the subducting and the upper plate of 1 and 0 $\mathrm{cm\,yr^{-1}}$, respectively, (model S9). The model shows the recycling of large amount of subducted material derived from the microcontinent.

Movie S5. Evolution of composition and velocity field for model with 50 km-wide microcontinent located 25 km far from the upper plate and velocity of the subducting and the upper plate of 1 and 0 $\mathrm{cm\,yr^{-1}}$, respectively, (model M1). The model shows the jump of the subduction channel behind the microcontinent.

Movie S6. Evolution of composition and velocity field for model with 50 km-wide microcontinent located 25 km far from the upper plate and velocity of the subducting and the upper plate of 4 and 0 $\mathrm{cm\,yr^{-1}}$, respectively, (model M3). The model shows the development of back thrust fault in the upper plate behind the accretionary wedge.

Movie S7. Evolution of strain rates for model with 50 km-wide microcontinent located 25 km far from the upper plate and velocity of the subducting and the upper plate of 4 and 0 $\mathrm{cm\,yr^{-1}}$, respectively, (model M3). The model shows interruption and restart of the subduction along a new subduction channel behind the microcontinent with the detachment of the lower crust of the microcontinent and its subsequent subduction.

Movie S8. Evolution of composition and velocity field for model with 50 km-wide microcontinent located 50 km far from the upper plate and velocity of the subducting and the upper plate of 1 and 3 $\mathrm{cm\,yr^{-1}}$, respectively, (model M6). The model shows the detachment between the upper and lower continental crust of the microcontinent that occurs in depth, while it does not exhibit jump of the subduction channel at surface.

Movie S9. Evolution of composition and velocity field for model with 50 km-wide microcontinent located 100 km far from the upper plate and velocity of the subducting and the upper plate of 4 and 0 $\mathrm{cm\,yr^{-1}}$, respectively, (model M11). The model shows a jump of the subduction in front of the microcontinent.

Movie S10. Evolution of composition and velocity field for model with 75 km-wide microcontinent located 25 km far from the upper plate and velocity of the subducting and the upper plate of 4 and 0 $\mathrm{cm\,yr^{-1}}$, respectively, (model L3). The model shows the interruption of the subduction and the final setting resembles that of a typical continental collision.

Movie S11. Evolution of composition and velocity field for model with 75 km-wide microcontinent located 25 km far from the upper plate and velocity of the subducting and the upper plate of 4 and 3 $\mathrm{cm\,yr^{-1}}$, respectively, (model L4). The model shows interruption and restart of the subduction along a new subduction channel inside the microcontinent.

Movie S12. Evolution of composition and velocity field for model with 100 km-wide microcontinent located 25 km far from the upper plate and velocity of the subducting and the upper plate of 1 and 0 $\mathrm{cm\,yr^{-1}}$, respectively, (model XL1). The model shows both accretion of a greater amount of material at the trench and, simultaneously, recycling of subducted material from a great depth.