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Extension of chemically stratified mantle lithosphere: numerical modeling

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Using a 2D coupled thermo-mechanical numerical mode, we investigated the extension of a continental lithosphere with a chemical layer (hydrated layer) in the mantle lithosphere. During the lithospheric extension, the chemical layer broke through the overlying mantle and emplaced into the crust, which greatly accelerated the rupture of the crust.

The features of the chemical emplacement such as the size, geometry and emplacing time, have been tested with respect to the depth and thickness of the chemical layer and the shear heating.