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The role of mechanics in the modelling of common rock microstructures

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Understanding rocks at the microscale is essential to comprehending Earth's history and making reasonable predictions about how planetary processes may change in the future.

Advanced models for complex rock microstructures, such as symplectites or a development of exsolution lamellae, have been developed (Kuhl & Schmid, 2007; Petrishcheva & Abart, 2009). Despite of this recent valuable progress in our understanding of these microstructures, the mechanisms controlling its evolution especially from slowly cooled rocks are still not complete.

Commonly, such models focus solely on the chemical process. Interestingly, mechanics, i.e. stress and pressure redistribution, may also play an important role on microstructure evolution. In this contribution, we investigate the coupled, chemo-mechanical, effect for representative rock microstructures. We provide a comparison between purely chemical vs. coupled chemo-mechanical systems and provide predictions on the evolution of the given microstructures in 3D.

References:

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