

Continental growth models demystified

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So far proposed models of continental growth exhibit bewildering diversity, but this diversity is rather superficial. By understanding how different growth models are built and what they are meant to constrain, we can gain deeper insight into the evolution of continental crust as well as the dynamics of the early Earth. There are three kinds of growth models: crust-based, mantle-based, and others. Crust-based models provide only the lower bound on net crustal growth, and mantle-based models aim at constraining net crustal growth itself. Other models are also about net crustal growth, but they are subject to greater uncertainty. In the presence of crustal recycling, crust-based models are expected to be different from mantle-based models, and more important, the difference between these two kinds of models provides important constraints on the operation of plate tectonics in the early Earth. Some popular misconceptions in the recent literature are also discussed.

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