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Numerical Modeling of deep continental crust subduction

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Numerical models of ocean subduction to continental collision transition were performed to investigate the role of convergence velocity and strength of the plates affecting the rate of continental crust subduction. Crustal recycling is proportional to the convergence velocity, with amounts of recycled crust ranging from 4000 to $>$12000 cubic km/Myr/km; lithospheric strength, on the other hand, determine the style of orogeny and the relative proportions of recycled crust (sediments, upper crust, lower crust): one-sided sudbutcions allow rising of buoyant crustal material (mainly sediments and upper crust) that emplace at the base of the lithosphere, whilst with two-sided subduction a thick crustal body is embedded and thermally isolated between the two rolling plates. In any case, the amount of recycled crust is the same, and varies exclusively with the convergence velocity. Furthermore, runs with an Archean geotherm show that in the past crustal recycling was a much more vigourus process with important consequences on crustal growth estimations.