



Effects of oceanic plate visco-plastic parameters, initial geometry and inclination of plates interface on subduction initiation

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As one of the fundamental part to consider when dealing with plate tectonic cycling, subduction initiation has attracted increasing attentions of geophysicists. An increasing number of researches, include how dose it happen? The exact temporal constraint, the factors that influence its evolution et al., have been made. In this study, we explore how visco-plastic parameters, initiate geometry and dipping angle of plates interface affect subduction initiation and following subduction evolution, using a finite element code ASPECT(Advanced Solver Problem in Earth's Convection).

What we can imply from our numerical models are: 1) Internal friction angle of sediment and oceanic crust directly affect the strength of subducting plate and coupling between two plates. With a larger value of the above internal friction angle, subducting plate will get stronger and is easier to break which will lead to a rise atop the surface of overriding plate, subducting angle will increase. 2) The inclination of subduction plate is positively correlated with trench depth. 3) Decreasing initial dipping angle will lead to a gentle subducting angle and a lower subducting depth. That is, when subducting angle gets steeper, trench depth increases.