

Dynamical modelling of the subduction of the plate: Initiation of the subduction

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Plate subduction is the most significant character of the Earth's tectonics. The dynamical cause of the subduction is not well understood because of the difficulty to develop dynamical models. In order to understand why there exists subduction, we have studied the onset of the subduction. To understand these problems, we have developed dynamical subduction models in which the plate motion is realized as a part of mantle convection. We examine mechanisms of the subduction initiation using the model with the viscoplastic rheology. A thrust fault between the subducted and overriding plate is simulated as a layer with the low viscosity or the weaker yield stress. We find that the subduction initiates under the compressional stress field when the viscosity or the yield stress is high.