

Mantle Convection with a Lateral Variation of Yield Stress with Memory

Satoru Honda[1], Tomoeki Nakakuki[2]

[1] Dept. Earth Planet. Syst. Sci., Hiroshima Univ., [2] Dept Earth Planet Syst Sci, Hiroshima Univ

We study a 2D numerical model of convection in which the yielding is affected by a past history of yielding and the yield stress (YS) changes horizontally. The edge where the YS changes controls the place of sinking (See Honda et al. [2000], also). The flow shows a considerable fluctuation with time, that is, the alternative appearance of plate-like and the stagnant regime. Despite this, the place of sinking is controlled by the heterogeneous distribution of YS. The long survival of the high YS region makes the temperature below low. Because of this, the horizontal temperature variation is large and the past memory of subduction, i.e., low YS region, remains near the boundary where the YS changes. This is probably why the subduction repeats there.