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Heterogeneous stress analysis and Shmax trajectories around Shikoku

Atsuki Kubo[1*], Masami Koike[2]

[1]Earthq. Obs. Fac. Sci. Kochi Univ., [2]Fac. of Sci. Kochi Univ.

Philippine Sea Plate is obliquely subducting beneath Shikoku. Shikoku is also close to backarc opening region toward west. Thus stress state in Shikoku is very important to understand dynamics of oblique subduction and/or backarc opening. To reveal stress field, we use focal mechanisms and stress inversion technique. We determined focal mechanisms using observations of our observatory and exchanged data among other institutes and universities since 1995. We obtained 1950 high accuracy focal mechanisms (depth lt 20 km). Stress inversions using these results are conducted for 29 divided regions. We use multiple inverse technique for the stress inversion (Yamaji, 2010). Number of stress solutions within subregions are adjusted to 2 or 3 using analyzed results. Obtained stress solutions shows 4 stress provinces(1) Shikoku, 2) near MTL, 3) Sanyo, 4) Sannin,) across arc. In contrast, along arc variation, extensional stress states appear in Iyonada, Takanawa, Bungo-channel, Western Shikoku in addition to widely distributed compressional stress state. This extensional stress shows N-S extension which is different from those of Terakawa and Matsu'ura (2010) (E-W extension). Trajectories of Shmax directions are drawn using obtained stress states based on Lund and Townend (2007). Obtained trajectory map is similar with that obtained from geological research (Tsukuda, 1992).

Keywords: Stress field, focal mechanism, Maximum horizontal compression, Shikoku