Crustal heterogeneity beneath southwest Japan estimated from direct and Moho reflected waves

Mohamed Salah[1]; Dapeng Zhao[2]; Jianshe Lei[2]; Mohamed Farouk Abdelwahed[2]

[1] Earth Sci., Ehime Univ; [2] GRC, Ehime Univ

In this study we have used later phases reflected at the Moho discontinuity in addition to direct arrival time data to study the 3 D crustal velocity structure beneath southwest (SW) Japan. We have collected more than 6000 direct and Moho reflected phases and used them to obtain P and S wave velocity structures in the study area. Our results revealed significant low velocity anomalies beneath the active and Quaternary volcanoes in SW Japan. Results obtained using each data set (P, PmP, S, and SmS) are generally consistent with each other and all showed low velocity anomalies beneath most of the active and Quaternary volcanoes, western Kii Peninsula and eastern Shikoku. Ray path analysis showed that the data set we used has a good ray crisscrossing that is sufficient to accurately locate the velocity anomalies in the study area. In addition, results of the checkerboard resolution test indicate that these structures are generally well recovered and that adding later phases could significantly improve the resolution of the tomographic images in comparison with those from first arrivals alone.