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Geodynamics of subducting slab under Izu collision zone

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The Philippine Sea plate subducts northward under the Honshu arc, Japan. The existence of relatively thick crust of the intraoceanic arc, Izu-Bonin arc, along the western margin of the Philippine Sea plate causes a complex tectonic environment. In the south Kanto area, an accretionary wedge composed of late Cenozoic sediments overlies the downgoing Philippine Sea plate. In western part of the south Kanto area, the Izu-Bonin arc has collided with the Honshu crust; remnant pieces of the Izu-Bonin arc such as the Tanzawa block were accreted to the Honshu crust. In order to interpret the geodynamics of the subducting slab under the izu collision zone, we examine mineral assemblages and dehydration process of the subducting lower crust of the Izu arc. Previous study infers that hornblende gabbro is a main constituent rock of the lower crust of the Izu-Bonin arc. Here mineral assemblages within the gabbroic composition from the Tanzawa gabbroic rocks was calculated by Theriak-Domino software, and stability fields of minerals and dehydration process are discussed. The estimated dehydration process and calculated stability fields of amphibole and garnet expects that phase change of gabbroic rocks to garnet-bearing rocks is an important process to explain the geodynamics of the subducting slab under the Izu collision zone. In this study, we propose a new hypothesis that the microearthquakes under the Izu collision zone may be triggered by phase change of gabbroic rocks to garnet-bearing rocks which seems to enhance stress concentration by volume change in the subducting lower crust.

Keywords: Izu collision zone, Philippine Sea slab, geodynamics