Significance of the ridge-shaped Philippine Sea slab for the crustal deformation in the Amurian Plate Eastern Margin Mobile Belt

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In order to discuss various kinds of crustal deformation with wide-ranging time scales in a certain plate convergence zone for the purpose of gaining a unified understanding of this phenomenon, it is indispensable to know the real plate convergence mode in the study zone as an essential boundary condition. From this viewpoint we propose a working hypothesis on the plate convergence in the middle Honshu Island, Japan.

Miyoshi and Ishibashi (2004), based on the study of seismicity and focal mechanisms, pointed out the existence of ridge-shaped, gently-dipping and shallow Philippine Sea slab (hereinafter, IKS; Isewan-Kohoku slab) beneath the belt from Isewan (Ise Bay) to Kohoku (area on the northeast of Lake Biwa) in central Honshu, which has been subducted at the Nankai trough. Miyoshi and Ishibashi (2008) considered that IKS is contacted the overriding southwest Japan lithosphere (crust only) which is presumably moving eastward (as a part of the lithospheric block in the Far East, say, Amurian plate) and colliding against northeast Japan at ISTL (Itoigawa-Shizuoka Tectonic Line) to the east (Ishibashi, 1983, 1984, 1995). They interpreted that this contact meant a kind of collision for the overriding crust and explained the neotectonics in and around the Kinki Triangle on the west of the Isewan-Kohoku belt by this collision.

In this paper we develop Miyoshi and Ishibashi's (2008) idea in the framework of Ishibashi's (1995) Amurian Plate Eastern Margin Mobile Belt hypothesis. We consider that double collision is occurring for the eastward-moving southwest Japan lithosphere, one is at ISTL and the other is at IKS, affecting widely the crustal deformation and tectonics in central Honshu. This idea can explain so-called Niigata-Kobe Tectonic Line (Sagiya et al., 2000), distribution of velocity vectors of GPS stations in central Japan (e.g., Heki and Miyazaki, 2001), low activity of the Tokai earthquake relative to the Nankai earthquake, and so on. Concerning inland large earthquakes, several disastrous events have occurred since the 1995 Kobe earthquake in accordance with Ishibashi's (1995) hypothesis and long-term prediction. In the future, from the viewpoint of the present study, one of the noticeable area is that to the west of Isewan-Kohoku belt including the region around Wakasa Bay.