

## Integrated deformation scheme around the northern Izu-Bonin arc, as a "strain concentrated zone" including N-S crustal-shortening

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We present a simple model of "integrated deformation scheme", including massive N-S crustal shortening with both the elastic and inelastic components, at the Izu Peninsula and its vicinity of the northeastern border of the Philippine Sea plate (PH). In our model, the so-called "strain concentrated zone" covers the area around the Izu peninsula.

The main tectonic elements governing the integrated crustal deformation concerned, are as follows;

- (1) Northward (or northwestward) compressive lithospheric convergence with some components of scraping off the upper crustal layer of PH, at the northern end zone of the Izu peninsula. As stated in previous studies, this process involves a differential horizontal motion between the shallower crustal layer and deeper part of PH lithosphere.
- (2) 3D deflection effects of PH due to both of the northwestward and northeastward bending processes at the Suruga and western Sagami troughs, respectively.
- (3) Dynamic behavior of PH slab within the wedge mantle beneath the area from the metropolitan area to the Shizuoka prefecture.
- (4) Confined zonal right-lateral shear deformation along the volcanic front (VF) of the Izu-Bonin arc system. Non-negligible contrast across VF in both the thermal state and the crustal strength of PH.

Our integrated model requests inevitably a long-term increase in the crustal thickness due to the massive strain accumulation of both the larger N-S (or NNW-SSE) shortening and the smaller E-W elongation, especially at the northern part of the Izu-Bonin arc.

Keywords: integrated deformation scheme, strain concentrated zone, crustal thickness, Izu peninsula, Izu-Bonin arc, northern border of the Philippine Sea plate