Collision of Izu Island Arc and Slab of Philippine Sea Plate

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1. Zenisu Ridge and geometry of slab subduction

The slab cannot descend along reentrant subducting boundary without dehiscence. If the dehiscence could not reach to the subducting boundary, the backward breakage might develop around the reentrant corner. The connecting part of the Suruga and Nankai Troughs is reentrant subducting boundary with the Zenisu Ridge as the backward breakage.

2. Matsuzaki and Misaka Uplift Zones as same type of Zenisu Ridge

Volcanic rock of Izu Island Arc is colliding with deep sea mud of Shizuoka side at the Senoumi Gorge. The colliding volcanic rock is unconformably covered with shallow marine sandstone. The sandstone locates at 37 km from Izu Island Arc axis. Because shallow area is limited within 20 km from arc axis except of the Zenisu Ridge, the colliding volcanic rock should be eroded on the summit of backward breakage like as the Zenisu Ridge. Misaka Uplift Zone at 45 km west of Tanzawa consisted of deep sea volcanic rocks and deep sea mud, also covered unconformably with shallow marine sandstone.

3. Multiple collisions and double descending slab

Collision of Izu Island Arc is characterized by multiple collisions of Tanzawa and next Izu Peninsula. Hypocenter distribution of deep earthquakes is consistent with the double descending slabs along northern and southern margins of Tanzawa, estimated from the multiple collision process.

4. Step out of convergent boundary and slab dehiscence of reentrant subducting boundary

The backward breakages of Zenisu Ridge, Matsuzaki and Misaka Uplift Zones indicate dehiscence of descending slab. The descent slab along the Suruga and Nankai Troughs has discontinuities and big variations in dip. The discontinuity under the Nobi Plain should be slab dehiscence for the Zenisu backward breakage. The east slab of the dehiscence is shallower than the west, indicating descent of the west slab under the east slab. If a separated slab would descend under another slab with the tectonic events such as collision, the dehiscence should extend upward. If the dehiscence might extend to the arc axis, step out of subduction boundary could be realized .

The dehiscence of slabs with descent for Matsuzaki Uplift Zone extended to arc axis along the southern margin of Tanzawa and step out of subduction boundary was realized.

5. Reentrant subducting boundary off the Cape Nojima of Boso Peninsula

Reentrant subducting boundary exists off the Cape Nojima. The bank, Omuro Dashi, correlates with the backward strained area, and focal faults of the Taisho and Genroku Kanto Earthquakes correlate with the separated slabs by the dehiscence. Because the Cape Nojima reentrant boundary is similar to the Zenisu Backward Breakage, the reentrant boundary was formed by the backward breakage.

6. Tectonic evolution of Kanto Area and the Kujukuri Trough

Distinguished tectonic evolution of Kanto Area is demonstrated by Kanto Tectonic Basin and Kurotaki Unconformity. The thick sediments covering on the Kurotaki Unconformity filled the Kujukuri Trough, which developed by the subduction along the Median Tectonic Line from 2.5 Ma to 0.5 Ma.

7. Backward Breakage of the Cape Nojima and the Kujukuri Trough

Subduction along the southern margin of Tanzawa-Mineoka Belt is evidenced by the accretionary sequences since 7 Ma and deep sea fan deposits of 3.5-5.5 Ma. The backward breakage should be happened during the subduction, and make the Kurotaki Unconformity and initiate co-subduction along the Median Tectonic Line of the Kujukuri Trough. The backward breakage reached to the subduction boundary, and then the subduction boundary stepped out 0.5 Ma to the backward breakage as the present feature along the Sagami Trough.

The complicated slabs under the Kanto Area are related with the process of subduction along reentrant boundary, backward breakage and step out of subduction boundary.