

Seismic reflection images of shallow structure across the Suruga Trough axis in the north-middle part of the Suruga bay, central Japan

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Suruga Trough is located at the northeastern end of the Nankai Trough and is the plate boundary between the Philippine Sea Plate with the Izu-Bonin arc and Eurasian plate. It is necessary to clarify the images of shallow structure as well as deep structure using intensive high-quality geological and geophysical observations since the subduction history and process of this megathrust could not be understood well.

In this study, we show the results of shallow subduction zone images across the Suruga Trough axis by means of 2D seismic reflection survey systems in 2016, 2017 and 2018.

We conducted the 2-D seismic reflection and refraction surveys by using our portable system and a research vessel 'Shinyomaru-IV' (986 tons,) of Tokyo University of Marine Science and Technology (Tsuruga *et al.*, 2016, 2017, 2018, and 2019). We used Bolt air-gun systems at a shot interval of 25 m or 50 m with a total air volume of 1024, 1050 or 1950 cu-in with a Hydroscience recoding system including 600-m 96-ch digital streamer-cable. These air-gun shots were also recorded by OBSs (e.g., Baba *et al.*, 2017, 2018). Especially in 2018, we simultaneously conducted the particular 60-km onshore-offshore seismic refraction survey by using Bolt 'Tri-Gun' sources (a total volume of 1950 cu.in) with a shot interval of 25 m (Sato *et al.*, 2019). All 9 survey lines were located in the areas from northern to middle part of Suruga bay with a total length of 201 km. The survey in 2018 were supported by the Integrated Research project on the Fujigawa-kako Fault zone funded by the Ministry of Education, Culture, Sport, Science and Technology, Japan.

We analyzed the seismic data by means of pre-stack time migration (PSTM). The results indicate that some continuous west-tilting reflection phases may be appeared around an upper boundary of oceanic plate down-going toward west. Such reflection images similar to the seismic images observed at other survey line across the trough axis in the middle to southern areas. According to Sato *et al.* (2019), such reflection phases can be continued to the other reflection phases observed in the deep structure along the onshore-offshore refraction survey. We also found that several thrust faults are located around the northwestern areas of Suruga Trough, indicating the recent subducting activity of the Philippine sea plate.

Keywords: Suruga Trough, seismic reflection survey