

The 1st Sea Trial of 2-D Seismic Reflection and Refraction Surveys in Suruga Bay, Central Japan, by TUMSAT (1st Report)

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Tokyo University of Marine Science and Technology (TUMSAT) establish a new school for Marine Resource and Environment from April 2017. We adopt a new portable 2-D seismic reflection survey system in order to educate our students to the observation technology and methodology in an oceanic area and under sea floor and also to research the features under sea floor such as plate boundary area, etc. In this report, we show the outline of the first sea trial of seismic reflection and refraction surveys in Suruga Bay, Central Japan, conducted by TUMSAT, and its preliminary results.

Our portable seismic system consists of three 10-ft containers for the seismic air-gun sources, an air compressor system, and streamer-cable system, together with some controllers and recording systems in a dry laboratory. The air-gun source system consists of two pairs of Bolt Twin-Gun (a pair of 1900LL, 260 cu.in x 2) and can be towed at both gunwales. Hydrophone receivers array consists of Hydrosience digital streamer cable which has 96 channels with a sensor interval of 6.25 m inside a cable of 600 m long, and SEAMAP Tailbouy to measure the location at the tail of the cable. Research vessel 'Shinyomaru' was renewed on 2016. Its principle specifications: length, beam, and gross tonnage are 65 m, 12.5m, and 986 tons, respectively.

We conducted the 2-D seismic reflection survey and refraction survey with 21 ocean bottom seismometer in Suruga Bay, from Nov. 13 to 19, 2016, in order to test the system specification in a ocean area. Suruga Bay (i.e., Suruga trough) is located at the plate boundary between the Philippine sea plate and Eurasia plate. We therefore tried to clarify a shallow structure in this important area by means of both seismic reflection and refraction surveys. Four survey lines (i.e., A to D line) were located at the eastern, northern and western area of Suruga Bay with a total measurement distance of about 74 km. Air gun was shot at an interval of 50 m under a ship speed of about 3.5 knot.

Preliminary results of seismic section shows variable bathymetric features and structure under the sea water. For example, beneath A-Line we can find a sedimentary layer with a thickness of ~100 m under the sea floor and it lays above the layer boundary with a strong reflection which may be related with the topography around the coast. The details of our result will be shown in a poster presentation.

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