

## High quality 4-D active monitoring of an ocean bottom structure by using accurately-controlled signal system and a mobile active seismic system

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A real time high-quality monitoring of the various environmental perturbations of underwater is very difficult but we expect that high-density high-quality accurate data in both 3-D space and 1-D time will be very effective and useful particularly.

We have been developing new method and technology to monitor the geophysical and/or geochemical changes in time and space of an ocean bottom structure such as resource reservoirs by accurately-controlled continuous signal system and using an autonomous underwater vehicle (AUV) (e.g., Tsuruga *et al.*, 2010; Tachibana and Tsuruga, 2015; Mogi and Tsuruga, 2016). We have been developed portable seismic source system which consists of an active seismic source system and receiver array system with a small atomic clock IC chips in each system and they can synchronize / know the clock time by GPS system as an accurate clock in water.

In this meeting we show the result of sea trial using these active systems.

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