

STT071-P01

Room: Convention Hall

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## Feasibility of a pop-up ocean bottom seismometer with atomic clock(2)

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The Accuracy of timing is one of the most important elements in the seismic observation. Timing from the GPS signal is used for permanent stations and inland temporary observations. Accuracy of the timing depends on the internal clock for the case of pop-up ocean bottom seismometers.

Accuracy of 0.1 s in one year is available through the internal clock.

Analysis of ACROSS signal requires stacking, in which timing error should be less than one sampling interval. Furthermore arrival variation of 0.1 ms can be detected with cross-correlation technique from the ACROSS signal.

Katsumata and Hamada (2009) presented that the currently available atomic clock had a size small enough to be installed in a pop-up OBS. However the energy consumption was too large for an OBS. A less power consumption is being achieved in atomic clocks.

An atomic clock of 0.125W is available now. The energy consumption in four-month observation would be 360Wh. For a OBS with 1500Wh primary battery, the energy consumption of 360Wh corresponds to about one quarter of the capacity, which would be acceptable level.

The accuracy of the clock is about  $10^{-10}$ , which would be timing error of 0.01 seconds during four months, which is good enough for stacking in ACROSS analysis.

Keywords: pop-up ocean bottom seismometer, atomic clock