

## Overview of the repeated surveys of seafloor displacement at Kumano-nada in 2004

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For understanding of the mechanism of subduction large earthquakes, our group has been made GPS/Acoustic measurements to detect horizontal crustal displacement in ocean. As has already been started at the Off-Sanriku, we also started surveys in Kumano-nada since 2003. In the cruise in 2003, we deployed PXP (ocean bottom stansponder) and tested acoustic measurement. In 2004, we started full-blown surveys.

GPS/A measurement is consists of set of acoustic ranging between PXPs and transducer equipped on a towed buoy, whose position and attitude is monitored with a set of GPS antenna. The survey consists two part; one is a simple positioning of individual PXP, the other is positioning of PXP array itself. For the individual PXP, positioning precision is roughly several tens cm because of unknown of the sound velocity in seawater, however, even using thus obtained array configuration, final precision of array positioning becomes 1--5cm. For details of the precision, please refer our counterpart presentation in the oral session.

In the August 2004 survey, we conducted individual positioning of five PXPs, which constitute two arrays (square and triangle). We also made the two array positioning. The arrays are configured as horizontal distance between the array center and each PXP is about 2000m, which roughly coincides with the water depth in this region. During the individual positioning, we made a circle survey, whose center is just above each PXP and the radius is about 2000m. Because of towing speed of the buoy is limited up to 2 knot (against water), it took 6 hours to make one circle. We made periodic XCTD/XBT measurement two or three times per a circle. This is inadequate to monitor the time variation of the sound velocity, however, even using averaged value of the velocity structure, effect of the variation of the velocity is less than the required precision of several tens cm for PXP positioning. After the circle surveys, we made fixed point observation at the centers of the two array for about 40 hours, respectively. As we mentioned in the other talk, standard deviation of the final array position is several cm. Taking into account number of the measured data is up to 1700 times, precision of the average position would be 1--2 cm.

In the November 2004 survey, we carried out the acoustic measurement at the centers of the two array since we have already determined the array configuration by individual positioning of the PXPs in August. Survey time was up to 2 days for each array. Since obtained data is under processing at the time of the submission of this abstract, comparison with the result of the August survey to estimate crustal displacement has not been done yet. However, we expect that it is possible to detect large displacement associated with the Kii-Peninsula Earthquake at September 9, if the data quality as high as the data in August.