The Present State of the Observation of Sea-floor Deformation and New instruments for Improvement

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We continue to monitor the seafloor deformation using the acoustic ranging and the kinematic GPS positioning technique. The 10-month repeatability of the system is +/- 3 cm in the two horizontal components. Then we should improve the accuracy by 1-2 cm because the convergence rate of the Philippine Sea Plate is about 5 cm/yr. We tested the two instruments: 1) temperature-depth profiler and 2) optical fiber gyro. The former can continuously measure the temperature profile of the seawater. The special and temporal in sound speed (especially in water temperature) is one of the main causes of accuracy reduction, and we should measure the continuous profile of sound speed. The latter is used for measuring the ship's attitude. In this talk, we present the results of the test of these instruments and their contribution in the improvement.