

## Position determination of the Tomakomai 11-m antenna VLBI station from Kashima-HOKT Geodetic VLBI experiment

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The 11-m VLBI antenna and backend system which had been equipped at Miura VLBI station until December 2000 was transported to the new site in the Tomakomai Experimental Forest of Hokkaido University. These facilities at Miura were used for the precise geodetic measurements under the so called Key Stone Project (KSP) conducted by the Communications Research Laboratory (CRL). One of the main objectives of the KSP was to monitor regional deformation and strain accumulation at plate boundary regions of the Kanto district. The new site is located in suburb of Tomakomai city where is located about 50 km SSE from Sapporo (We call the new site as 'Tomakomai site' hereafter.). The facilities were successfully installed before the end of September 2001.

In November 2001, the first geodetic VLBI observation among Tomakomai, Kashima 34m, and Kashima 11m was performed to determine accurate station position of the Tomakomai site and the system check. In addition to the new Tomakomai VLBI station, 11-m antenna and 34-m antenna VLBI stations at Kashima Space Research Center of the CRL were used in the experiment. Kashima 11-m antenna station has been routinely used as one of the four KSP VLBI stations since 1995, and this station was regarded as the reference station in the data processing. Kashima 34-m antenna station has been participating in the global VLBI experiments since 1991 and the position of the station can be used to estimate the position of the Tomakomai station in the international terrestrial reference frame. The large aperture of the Kashima 34-m antenna station also allowed us to obtain high signal to noise ratio with two other relatively small antenna stations.

The experiment was performed by receiving two frequency bands at S-band and X-band. The K4 VLBI system was used for data recording and data processing. Observations were made with 16-channels and the sampling mode was 4-Mbps per channel and 1-bit per each sample, and therefore the total data rate was 64-Mbps. Before the first geodetic VLBI experiment was performed, test observations were carried out between Tomakomai 11-m antenna station and Kashima 34-m antenna station on November 20, 2001. After confirming there was no problem with observation systems by processing the test data, the geodetic VLBI experiment was carried out for 24-hours from November 21, 2001. Recorded data were processed by using the KSP correlator system at Kashima. Fringes were found between all stations and the band width synthesis processing have been carried out. We are expecting to analyze the processed data using Calc and Solve geodetic VLBI data analysis software developed by the Goddard Space Flight Center of NASA and to determine accurate station position of Tomakomai 11-m antenna station.

We also carried out GPS observations at the nearest third order triangular station. This point is directly visible from the reference point of the 11-m antenna, i.e. intersection of the azimuth and elevation axes, and we expect the collocation measurements will provide useful data to tie local GPS network to the international terrestrial reference frame.

In our presentation, the results of the accurate position determination of the Tomakomai 11-m antenna VLBI station and the results from the GPS observations will be presented.