

Current Status of Development of Compact VLBI System with 1-m class Antenna (MARBLE): Part 4

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Multiple Antenna Radio-interferometer for Baseline Length Evaluation (MARBLE) is under development by National Institute of Information and Communications Technology (NICT) and Geographical Survey Institute (GSI). The aim of this system is to provide reference baseline lengths for calibration baselines. The calibration baselines are used to check and validate surveying instruments such as GPS receiver and EDM (Electronic-optical Distance Meter). It is necessary to examine the calibration baselines regularly to keep the quality of validation. The long (10 km) calibration baselines has been examined only by GPS receiver so far. However, to examine the 10 km calibration baselines by another technique is required. VLBI technique can give an independent measurement to examine the long calibration baselines. It is effective for the improvement of the reliability of validation to measure the calibration baselines by VLBI technique.

We developed a first prototype of small VLBI system that is core equipment for MARBLE. It was set up in NICT Kashima Space Research Center in 2008. This compact antenna of VLBI system is an advantageous design for the transportation, because the main mirror, mount, and receiver are easily detachable. In order to evaluate the performance of this prototype, we performed geodetic VLBI experiment with Tsukuba VLBI station (32m antenna) and Kashima 11m station in June, 2009. In addition, the second prototype of the small VLBI system also developed and set up in GSI Tsukuba in 2009. We performed geodetic VLBI experiment using these two prototypes and Tsukuba VLBI station in end of 2009. We successfully got a position of these compact VLBI stations from these VLBI experiments.

In this presentation, we will report on these geodetic VLBI experiments and current status of development of the compact VLBI system.

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