

Development of the small dish VLBI system CARAVAN2400

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The CARAVAN(Compact Antenna of Radio Astronomy VLBI Adapted for Network) is the series of the small radio telescope system that is dedicated to mobile e-VLBI measurements. The K5 VLBI system developed by the National Institute of Information and Communication Technology (NICT) enable us to perform e-VLBI measurements with high sensitivity, even if a small dish antenna is used. The K5 VLBI system includes the multiple PC-based VLBI system and the original software packages including data sampling and acquisition, real-time IP data transmission, and correlation analysis.

We are now developing a compact and geodetic VLBI facility with a 2.4 m diameter dish antenna, which is named CARAVAN2400. The one of objectives of the CARAVAN2400 development is to fill the gap in the VLBI station network in the Pacific and southern hemisphere. We have a plan to equip the compact VLBI system in such regions in order to contribute to the high precision co-location survey and the precise positioning of interplanetary spacecraft. We place the CARAVAN2400 as the prototype of such system. In addition, the research and development results of the CARAVAN2400 will be applicable to validate measurements results obtained by geodetic GPS receivers. The CARAVAN2400 consists of the 8 GHz low noise receiver, a frequency converter, an antenna control unit and the K5/PC-VSI giga-bit VLBI system etc. The dish antenna can be operated at the 1.0 degree per second maximum tracking speed for both azimuth and elevation angles.

On 30 March 2005, we successfully detected the X band solar signal using the CARAVAN2400, achieving 'first light'. During the fiscal year 2005, we have prepared to perform a VLBI measurement using CARAVAN2400 in collaboration with the Geographical Survey Institute (GSI). On December 7, 2005, we successfully detected the first fringe of the solar signal with the Kashima 11m antenna. In addition, we also succeeded to receive the radio signal from CasA using the single dish observation. We will present brief description of the system, results of performance test and outlook.