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Results of Geodetic VLBI Observations by Compact Antennas

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The Geospatial Information Authority of Japan (GSI) has carried out experiments of geodetic VLBI observations by using a compact antenna with a diameter of about 1.5 m, in collaboration with the National Institute of Information and Communications Technology (NICT). The compact antenna can be removed from its basement which is also available for the basement of GPS antenna. Thus we can directly compare the results of VLBI observation with those of other geodetic technique. Moreover the compact antenna is so portable that it enables us to carry out VLBI observations everywhere. Hence we study the compact antenna as a new generation of VLBI techniques.

Large antenna with a diameter over 30 m is necessary for us to obtain high precision geodetic results with the compact antenna. We carried out geodetic observations by using two compact antennas, first prototype at NICT Kashima Space Research Center and second prototype at GSI, and two large antennas, Kashima 34 m and Tsukuba 32 m. Then we obtained geodetic results of seven observations since December 2009. These observations include a wideband observation on 12 November 2010 in which we directly sampled intermediate frequency signals (500 MHz bandwidth) of S and X band with a sampling rate of 2 Gbps in order to obtain a higher precision result. We will report on the results of experiments of the compact antenna.

Keywords: VLBI, geodesy, compact antenna