

We are developing a compact VLBI system with 1.6 m diameter aperture dish in order to provide reference baseline lengths for calibration. The reference baselines are used to validate surveying instruments such as GPS and EDM and maintained by the Geospatial Information Authority of Japan (GSI). The compact VLBI system will be installed at both ends of the reference baseline. Since it is too insensitive to detect fringe between two compact dishes, we have designed a new observation concept including one large dish station into the baseline observation. We can detect two group delays between each compact VLBI system and the large dish station based on conventional VLBI measurement. A group delay between the two compact dishes can be indirectly calculated using a simple equation. We named the idea 'Multiple Antenna Radio-interferometry for Baseline Length Evaluation (MARBLE)' system. The compact VLBI system is easy transportable and its monument pillar is designed to install typical geodetic GNSS antennas easily and an offset between a GNSS antenna reference point and a location of the azimuth-elevation crossing point of the VLBI system is precisely collocated within less than 0.2 mm uncertainty. We have carried out seven VLBI experiments on the Kashima-Tsukuba baseline (about 54 km) using the two prototypes of the compact VLBI system during December 2009 to December 2010. The averaged baseline length and repeatability of the experiments is 54184874.0 ± 2.4 mm which is well consistent with those obtained using GPS measurements.