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Geodetic Analysis of the First 24-hour GPS-VLBI Hybrid Observation

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We have developed GPS-VLBI (GV) Hybrid System to integrate VLBI and GPS techniques at observation level, concretely hardware level. In the system, VLBI antennas and GPS antennas located at the same site receive signals from quasars and GPS satellites, respectively. Both signals are recorded and correlated in general VLBI way being referred to identical frequency standard at each site.
In 2009, we carried out a 24-hour validation experiment of the system between Kashima and Koganei using 11m VLBI antennas and temporary GPS antennas. We stably acquired huge volume of GPS data through VLBI system during the experiment and obtained correlation fringes with high signal to noise ratio simultaneously from all GPS satellites in the sky. We could substantiate the practicability of the GV Hybrid System eventually. In this paper, we present the geodetic analysis results of GV Hybrid Observation data and discuss limitations of the current system and the future observation plan.