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Colocations of Space Geodetic Techniques on Ground and in Space

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To improve the performance of the major space geodetic techniques, GNSS, VLBI and SLR, the main effort is going to the reduction of systematic errors. Co-location of these techniques at fundamental stations provides the best chance to identify such systematic errors.
During the last year the 20m Radio Telescope in Wettzell was modified to down-convert the GNSS L1 signal, which is then recorded using standard VLBI Mark5 technique. After developing the necessary procedures, the observations of GNSS signals have been tested together with the Onsala Space Observatory. It is planned to perform such observations in the future on a regular basis with Onsala and other capable VLBI stations, including co-located SLR measurements. This will provide the possibility to analyze the observations of the GNSS satellites simultaneously tracked by VLBI, GNSS and SLR.
We are reporting on the design and construction of the new receiving chain as well as the procedures enabling the observation of the GNSS L1 signal together with other technical aspects requiring simultaneous observation of satellites using different geodetic observation techniques. One of the problems is the fact that the VLBI satellite observations are singlefrequency measurements of the L1 signal only. The methods of using GNSS ionospheric information to correct single-frequency VLBI measurements have been studied. First results concerning the analysis of an initial set of observations from VLBI, SLR and GNSS we will presented and compared to the corresponding simulation results.